ADVISORY DEPARTMENT
OF THE IMPERIAL COLLEGE OF
TROPICAL AGRICULTURE.

REPORT

OF THE

AGRICULTURAL DEPARTMENT

DOMINICA.

1937.

ISSUED BY THE IMPERIAL COLLEGE OF TROPICAL AGRICULTURE.

1938.

IMPERIAL MYCOLOGICAL
1 AUG. 1938
INSTITUTE

[Price Sixpence.]

PRINTED AT THE BULLETIN OFFICE, ROSEAU, DOMINICA, B. W. I.

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LETTER OF TRANSMITTAL.

TRINIDAD,
25TH APRIL, 1938.

SIR,

I have the honour to submit the Report of the Agricultural Department of Dominica for the year 1937.

2. The progress of agricultural development was not impeded to any marked degree by adverse weather conditions. Total rainfall was normal, but distribution was very irregular. An unusually severe drought was experienced in the normal dry season, dry conditions extending late into June, and exceptionally heavy rains were experienced in January and November causing local flooding and minor damage to cultivations.

3. The total export value of agricultural produce showed a further increase in 1937, being approximately 8 per cent more than in 1936 and 56 per cent more than in 1934. There is every indication that there will be a further increase in production in 1938.

4. A further increase in production of limes was realized during 1937, but the increase was somewhat less than expected owing to severe and persistent attacks of withertip disease. Some few more years must elapse before average annual maximum production of limes from the areas replanted with budded limes can be assessed with reasonable accuracy. The products of the lime industry in 1937 were successfully marketed, but increased production of limes in the West Indies and elsewhere call for the closest possible co-operation between producers in marketing their produce if prices are to be maintained at a profitable level.

5. There was a marked increase in the production of exportable bunches of bananas during the year, total production amounting to 142,000 bunches as compared with approximately 100,000 bunches in the previous year. The year 1937 saw the advent of several factors favourable to the industry, namely an increase in price of 4 cents and 3 cents respectively for nine and eight hand bunches, the decision of the Canadian National Steamships to include Portsmouth as a port of call for their fortnightly service of ships for the shipment of bananas, and the completion of the motor road from Hatton Garden to Portsmouth. While the two latter factors were of special advantage to producers in the Northern District, lack of roads and suitable transport facilities serve to retard expansion of the industry in other parts of the Island.

6. The incidence of Panama disease throughout the Island cannot, in my opinion, be viewed without some measure of alarm if production is expected to be increased and maintained for a reasonable period of years at a higher level. The present status of the disease warrants the continuance of an active inspection service and the fullest co-operation between producers and the inspection officers. The occurrence of Cercospora leaf spot disease, discovered at the beginning of 1938, constitutes a further menace to the industry.

7. Washington Navel oranges produced in Dominica continue to attract interest in Canada and by reason of their excellent quality and flavour command good prices. Present indications are that this variety offers the best prospects for finding a profitable market in the future. There was no marked increase of orange exports during the year, nor has the production of Marsh seedless grapefruit yet reached the stage when appreciable quantities are available for export.

8. There was a further increase in the number of coconuts exported, the number now exceeding one million. A smaller quantity of nuts were however converted into copra, the total quantity and value of coconut products exported in 1937 being little different from the corresponding figures for the previous year. The recent fall in the world price of copra to its present low level has completely removed the more hopeful outlook with which the industry was confronted at the beginning of 1937.

9. Of the smaller industries, the production of vanilla has proved to be the most remunerative. Exports of this crop were double in quantity and more than four times as much in value as those in 1936. Some attempt was made during the year to rehabilitate cacao cultivations, but present low prices for cacao offer little encouragement for incurring expenditure on the cultivation of this crop. The possibilities of securing suitable varieties of vetiver and derris are receiving attention.

10. Useful progress has been made by the Department in the economic section of the Botanic Gardens and in the Experiment Station. A full and interesting account of the work in the Gardens and in the Station is given in the report. The ornamental section of the Botanic Gardens was maintained in its usual attractive condition.

11. The distribution of economic plants from departmental nurseries was conducted on a smaller scale than usual owing to the restricted propagation of plants in 1936 consequent on the curtailment of funds in that year. With the provision of adequate funds in 1937, however, it is anticipated that the Department will once more be in a position in 1938 to meet normal demands.

12. The training of pupils in plant nursery work, modern agricultural practice including cost accounting continues to be one of the major duties of the staff of the Department. The value which is attached to this course of agricultural instruction by the apposite class of local agriculturists may be gauged by the fact that there were fifty-six applicants in 1937 for less than half a dozen vacancies.

13. The Department has given much attention to the development of the Fruit Farm at Copt Hall, but progress in the development of the Farm continues to be slow. The younger citrus trees planted in 1936 and 1937 as fillers between the older trees, and also the recently planted wind belts, are making satisfactory progress.

14. The supervision and management of the Government Fruit Packing and Marketing Depot is a responsibility of the Agricultural Department and occupies much of the time of the Assistant Agricultural Officer. At the beginning of the year the Department took over the control of the section known as the Cold Storage Depot and was in consequence in control of the whole establishment. The work in the Depot increased during the year, the number of crates packed being some ten per cent more than in 1936.

15. Mr. R. G. FENNAH, who was appointed Entomologist of the Citrus Pest Investigation in the Windward and Leeward Islands in April, 1937, spent about five weeks in Dominica studying the status of the citrus weevil and other citrus pests.

16. The normal allocation of the duties of the Department between the various members of the staff was frequently interrupted during the year. The Agricultural Superintendent was absent from the Department for ten months of the year on temporary transfer for administrative work elsewhere. The senior Assistant Agricultural Officer was absent on leave for 3½ months. Much extra work and responsibility therefore fell on those members of the staff who remained in office and the staff is to be congratulated for carrying on the normal work of the Department under such difficulties.

I have the honour to be,

Sir,

Your obedient servant,

G. A. JONES,
Commissioner of Agriculture.

His Honour,
The Administrator,
DOMINICA, B. W. I.

AGRICULTURAL DEPARTMENT,
DOMINICA, B. W. I.
31ST MARCH, 1938.

No. 103.

SIR,

I have the honour to submit the Annual Report of the Agricultural Department, Dominica, for the year ended 31st December, 1937.

I have the honour to be,

Sir,

Your obedient servant,

H. B. PIDDUCK,
Acting Agricultural Superintendent.

The Commissioner of Agriculture,
Advisory Department,
Imperial College of Tropical Agriculture,
TRINIDAD, B. W. I.

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STAFF OF THE AGRICULTURAL DEPARTMENT, DOMINICA.

F. G. HARCOURT, M.B.E., F.R.H.S.	Agricultural Superintendent and Curator, Botanic Gardens.
H. B. PIDDUCK, N.D.A., N.D.D., (HONS.)	Assistant Agricultural Officer.
W. R. E. NANTON, Dip. Agric. (I.C.T.A.)	Temporary Junior Assistant Agricultural Officer.
L. A. ROBERTS	Clerk.
C. M. ALEXANDER .. .	Foreman.

GOVERNMENT FRUIT FARM, COPT HALL.

W. E. BASSETT	Assistant Agricultural Officer.
A. C. WINSTON	Foreman's Deputy.

GOVERNMENT MARKETING DEPOT.

W. E. BASSETT	Officer-in-Charge and Chief Fruit Inspector.
G. A. WINSTON	Clerk.
J. J. MCDOWELL	Foreman and Fruit Inspector.
E. A. TROTTER	Foreman Engine Driver.

AGRICULTURAL ADVISORY COMMITTEE.

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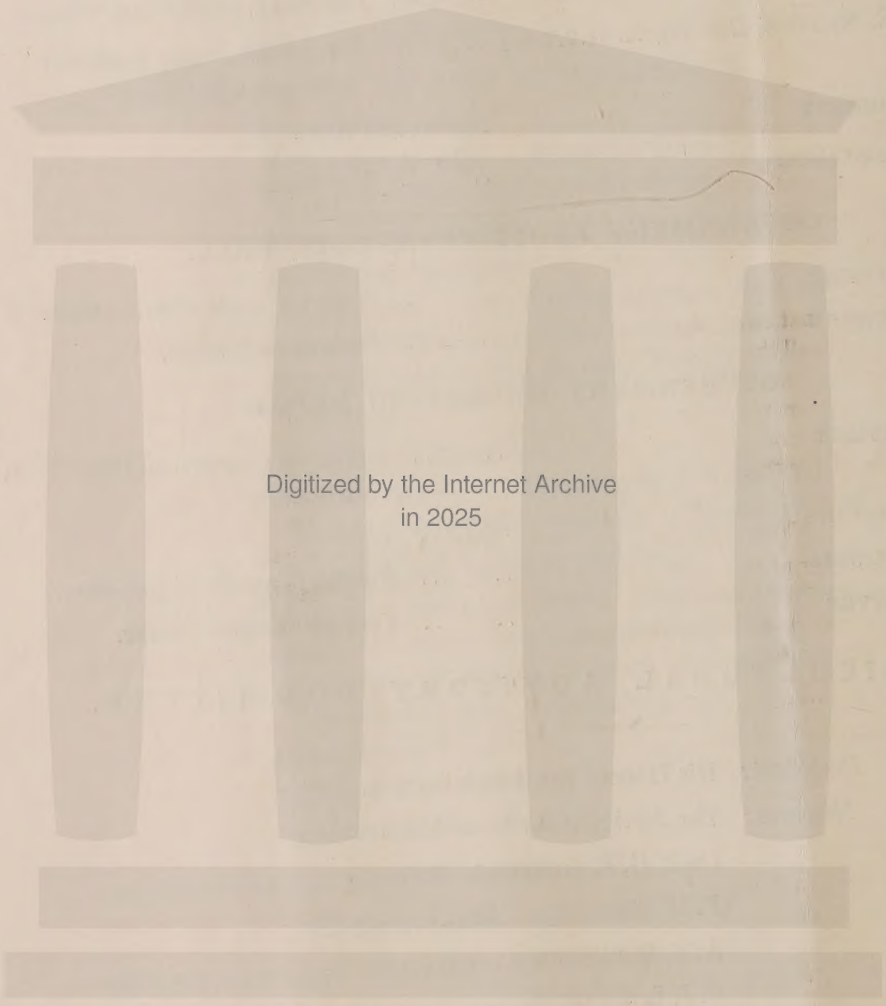
Secretary: The Assistant Agricultural Officer.



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ANNUAL REPORT OF THE AGRICULTURAL DEPARTMENT, DOMINICA.

FOR THE YEAR ENDED 31st DECEMBER, 1937.

SECTION I.

AGRICULTURE IN THE PRESIDENCY.

1. WEATHER CONDITIONS.

WEATHER conditions from February to October were in marked contrast to those experienced in 1936, in which year deluges, gales and thunderstorms were of frequent occurrence. Very wet conditions continued throughout January, but from February, not only was the dry season more than usually severe, but it extended late into June when the weather became very hot and sections of the leeward coastal belt suffered the effects of drought.

Except for the last two months of the year, the ensuing rainy season was characterised by much lower rainfall than usual together with periods of intense heat. September and October were particularly hot and dry, and conditions approaching drought again prevailed. In November, however, torrential rains occurred which did considerable damage to roads, bridges and cultivations, and during the month 20.85 inches fell, this being over one-quarter of the total for the whole year. Further deluges were experienced in December, so that eventually the total rainfall at the Botanic Gardens for 1937 reached 74.86 inches, as compared with an average of 74.02 inches for the past twenty years.

In the last quarter of the year a series of earthquakes occurred in the southern part of the island, increasing in frequency during November, but decreasing after the 12th December. The tremors were mostly of short duration and mild intensity, though one shock caused some damage to walls at the Grandbay police station.

The usual tabular summaries of meteorological observations are given in Appendix III at the end of this report. The thanks of the department are extended to planters who kindly co-operated and forwarded rainfall returns, and also to those who submitted records of earthquakes.

2. AGRICULTURAL INDUSTRIES.

Limes.—There was a further increase in the production of limes during the year 1937, although actual exports expressed as barrels of fruit totalled only 36,422 barrels as compared with 36,825 barrels in 1936—a difference of 403 barrels. This apparent decrease, however, was offset by a carry-over of lime juice and distilled lime oil equivalent to several thousand barrels of fruit, and it is estimated that total production was in the neighbourhood of 45,000 barrels.

While there are still a few dying cultivations of old seedling lime trees in the Northern district, the bulk of the crop was produced by young trees budded mainly on sour orange stock and planted during the past ten years or so to replace the seedling trees destroyed by hurricanes and root diseases. Prior to the appearance of withertip disease in 1922, it was estimated that there were about 5,000 acres of seedling limes in Dominica, but this disease has greatly restricted the area in which the crop can be economically grown and the area at present planted in budded limes is estimated to be around 1,500 acres. Very little extension is anticipated, but as only a small part of this acreage is approaching full bearing, a progressive increase in annual production may be expected, up to a maximum probably exceeding 100,000 barrels annually.

For the purposes of comparison with former years, the following table shows the crop shipped annually since 1919, calculated as barrels of fruit and expressed in round numbers:—

Years.	*Barrels.*	*Remarks.*
1919/22 (average) ..	422,000	Decreases due to withertip disease.
1923/26 (,,) ..	274,000	
1927/30 (,,) ..	165,000	Decreases due to hurricanes and root diseases.
1931 (actual) ..	68,000	
1932 (,,) ..	48,000	
1933 (,,) ..	36,000	
1934 (,,) ..	27,000	
1935 (,,) ..	28,000	Increases due to young budded trees.
1936 (,,) ..	36,800	
1937 (,,) ..	36,400	Produce not all shipped.

N.B. These figures do not necessarily represent annual production as there is often a carry-over of products at the end of a calendar year.

The year 1937 was not altogether a favourable one. In the early months, showery weather induced heavy attacks of withertip and blossom blight with consequent ill effects on fruit setting. The dry season was unusually severe and the rainy season which followed was characterised by long periods of exceptionally hot, dry weather until late November and December, when heavy deluges occurred. The result was a definite shortage of green limes when the demand and prices were good, and furthermore the main crop came in much later than usual Indeed the trees were still carrying an appreciable crop at the end of the year and as already mentioned, there was a fairly large carry-over of products, so that given favourable weather and normal market conditions, exports in 1938 should increase considerably.

The local Treasury return of products exported during 1936 and 1937 is as follows:—

Product.	*1936.*		*1937.*	
	Quantity.	*F.O.B. Value.*	*Quantity.*	*F.O.B. Value.*
		£		£
Essential Oil (Distilled) .	9,189 lbs.	9,612	8,213 lbs.	7,057
do. do. (Ecuelled) .	350 ,,	565	11 ,,	14
Oils in solution in Raw Juice exported ..	1,144 ,,	1,156	2,101 ,.	2,280
Green Limes	3,555 brls.	5,518	4,450 brls.	6,643
Raw Lime Juice ..	88,460 gals.	3,686	110,765 gals.	4,679
Concentrated Lime Juice	2,783 ,,	198	1,735 ,,	130
Lime Juice Cordial ..	—	—	49 ,,	5
Pickled Limes	140 brls.	352	110 brls.	263
		£21,087		£21,071

The following table shows the quantity of each product calculated as barrels of fruit actually exported in 1936 and 1937:—

Product.	1936.		1937.	
	Barrels of fruit.	Percentage of crop exported.	Barrels of fruit.	Percentage of crop exported.
Distilled Lime Oil ..	26.517	72.00	24,606	67.60
Ecuelled Lime Oil ..	2,800	7.60	88	0.24
"Oils in Solution" ..	3,813	10.36	7,003	19.20
Green Limes	3,555	9.66	4,450	12.20
Pickled Limes	140	0.38	275	0.76
	36,825	100.00	36,422	100.00

The market for green limes was again far from satisfactory. In the early part of the season when fruit was scarce, very good prices were obtained in the United States of America and Canada, but dropped rapidly as fruit become more plentiful, and although there was a fairly well distributed demand on the former market, exports were not as high as had been hoped for. The recommendations of the West Indian Fruit and Vegetable Council with regard to advertising in order to extend consumption, especially in Canada, has been favourably received in Dominica and on December 29th the leading growers were induced to meet and form the Dominica Lime Growers Association with this as one of its chief objects. The Association is in favour of the formation of a West Indian association and is prepared to become a member and enter into co-operation with that body for the collective welfare of the lime industry in these islands.

The demand for lime products other than concentrated juice remained steady at prices satisfactory to shippers and although actual exports of essential oils declined somewhat, those of raw juice and oils exported therein were in excess of the quantities shipped last year.

The increasing production of lime oil in the West Indies, the Gold Coast and elsewhere is causing some misgivings to growers, who realise that on this, the major lime product, the future of the whole industry so largely depends. In consequence local exporters are taking the greatest care not to enter into competition one against the other, and to market this commodity in a manner unlikely to prejudice their own interests or those of other islands in the group, and are disposed to give favourable consideration to suggestions put forward for the prevention of a collapse of the market.

Bananas.—Since April 1934, the Dominica Banana Association has been under contract with the Canadian Banana Co., Ltd. for the sale of all marketable Gros Michel bananas of seven hands and upwards at fixed f.o.b. prices, which were increased in 1937 by a bonus of 4 cents and 3 cents respectively for nine and eight hand bunches. This steady and assured market has been the means of converting what was formerly a purely minor industry producing bananas for local and inter-island consumption into one of considerable dimensions.

The expansion of the banana industry is clearly brought out by the following table, which shows the total quantities exported during the past five years:—

1933	22,304	bunches	valued at £	889 locally
1934	37,850	,,	,,	,, £ 3,253 f.o.b.
1935	71,527	,,	,,	,, £ 5,780 ,,
1936	99,858	,,	,,	,, £ 8,391 ,,
1937	114,812	,,	,,	,, £10,658 ,,

To the figures for 1937 should be added 27,651 bunches, mostly seven hands, short shipped owing to the Canadian Banana Company not always being able to ship the full number of bunches contracted for. Actual production in 1937 was therefore 142,463 bunches with an estimated value around £12,000 representing roughly one-sixth of the total value of all exports, and but for the hot dry weather prevailing throughout the greater part of the year, would probably have exceeded 150,000 bunches.

There are several factors militating against still greater expansion of the industry in Dominica, notable amongst which are difficulties of inland communication and transport; variation in the quality of fruit acceptable for export; and the small margin of profit accruing to growers whose lands are far distant from the ports of shipment. On the other hand, considerable development is taking place in the Northern District, for during the year the Canadian National Steamships Co. made Portsmouth a port of call and the Government completed the reconstruction of the main road to that port from Hatton Garden. The results have been the opening of areas formerly inaccessible and of considerably reducing the cost of production by cheapening carriage by road and eliminating freight by sea to Roseau. The Government has also improved a number of peasants' tracks in various parts of the island and contemplates increased expenditure on these and various road schemes in the future.

Work on the control of Panama Disease by the Agricultural Department is now well in hand and the recommendations made in 1936 by Dr. WARDLAW regarding a service of inspector-instructors are being continued. While these instructors and inspectors are concerned primarily with checking the spread of disease, they also devote much time to encouraging better methods of cultivating and handling bananas. Details of their work are included under the section on "Pests and Diseases."

All adverse factors are receiving the close attention of the Government and of the Dominica Banana Association and every effort is being made locally to foster the industry and build it up on sound lines for the benefit of the producer. The Association continues to manage the affairs of the industry and has again done much valuable work, especially in the regulation of the local purchase of fruit and its safe transport, selection and stowage on board.

Other Fruits.—The local Treasury returns of total exports and values of the principal fruits other than limes and bananas during the past two years are as follows:—

Fruit.	*1936.*		*1937.*	
	Quantity.	*F.O.B. Value.*	*Quantity.*	*F.O.B. Value.*
		£		£
Oranges	8,818 crates	5,169	8,873 crates	4,464
Oranges	1,968 brls.	2,150	2,574 brls.	2,594
Grapefruit	3,038 crates	1,586	4,375 crates	1,871
Avocado Pears	5,158 ,,	1,171	4,845 ,,	719
Mangoes	8,616 ,,	3,164	6,056 ,,	2,478
	27,598 pkgs.	£13,240	26,723 pkgs.	£12,126

Exports of the fruits mentioned in the foregoing table with the exception of oranges were on the whole rather disappointing. Most of the fruit shipped to Canada and Bermuda during the main season had to face severe competition with fruit from other sources, notably California and Jamaica, so that our agents in the ports of St. John, Halifax and Hamilton were sometimes unable to advise shipping in as large quantities as were available. By restricting the quantity shipped, however, prices were on the whole satisfactory and net returns generally remunerative.

The mango and avocado pear crops were somewhat smaller than usual, and the young cultivations of Marsh grapefruit have not yet borne much fruit. Until the latter come into more general bearing, it is unlikely that grapefruit exports will show any considerable increase, since the seedy varieties have become more and more difficult to market at a profit and it is unfortunately these varieties which now represent the greater part of the island's production. A part of the crop of seedy fruit was disposed of in the form of juice and oil, but these outlets were relatively small and not very profitable. Washington Navel oranges from Dominica continue to attract much interest abroad and to command excellent prices.

The fruit trade with neighbouring islands, which is principally in oranges packed in barrels, as well as small quantities of other fruits, is being well maintained. As practically

all fruit handled by the Government Marketing Depot is for consignment to distant markets, the review of the operations of this organisation in Appendix II will serve to indicate in more detail the present position of the Dominica fruit export trade other than in limes for the United States of America, and in bananas.

Coconuts.—There has been a gratifying increase in the exports of coconuts and copra in the past few years owing very largely to the co-operative marketing of these products on the part of growers in the Northern district, in which the chief cultivations are situated. The figures for the past three years are as follows:—

Product.	*1935.*	*1936.*	*1937.*
Dry coconuts	230,170	719,554	1,046,312
Copra (calculated as nuts) ..	696,980	684,030	290,040
Total nuts exported ..	927,150	1,403,584	1,336,352
F. O. B. Value (£)	1,518	3,588	4,044

It has been assumed that one nut produces approximately 2/5th. lb. of copra, or 5,500 nuts per ton. This factor might be regarded as rather low if the whole crop were converted into copra, but allowance has been made for the fact that the largest nuts are shipped as such and only culls and the smaller nuts are used for the manufacture of copra.

While there is a small inter-island trade in coconuts, the majority are shipped to Canada under contract renewable annually and prices having been attractive, exports have increased tenfold since 1934. Unfortunately complaints have been received of the difficulty of extracting the kernels from Dominica nuts which apparently adhere very firmly to the shells, and in consequence a somewhat lower price has been offered for supplies in 1938. Copra is mostly shipped on consignment to London and owing to the instability of the market in 1937 exports were much lower, though there was a fair quantity on hand for shipment early in 1938.

The chief shippers have under consideration the suggestions of the Trinidad Coconut Growers' Association that they should form a local association in order to market their products collectively through that body. Some of the growers, however, do not feel that the time is yet opportune for such a step and moreover there are certain difficulties to be overcome before the formation of a local association or its affiliation to the Trinidad organisation can be effected, one of the chief being that as already stated the bulk of the coconuts are at present exported under contract to Canada. This matter has nevertheless not been lost sight of and it is hoped that eventually steps may be taken along the lines suggested.

Cocoa.—The improvement in prices for raw cocoa at the beginning of the year did not hold for long, but the fluctuation was not sufficiently marked to render the main crop unprofitable, so that during the year continued interest was taken in the resuscitation of cultivations which had been in a semi-abandoned condition during the period of price depression. For this reason and despite the very dry weather conditions a fairly good crop was reaped and mostly disposed of, exports totalling 274,108 lbs. against 354,578 lbs. the year before.

Bay Oil.—Interest in this commodity was well maintained in 1937 considering that recent prices do not make the trade as attractive as in former years, and 19,635 lbs. were exported, being 1,647 lbs. less than in the previous year. The collection of leaves from wild or semi-wild trees is undertaken by peasants, some of whom also possess small stills. A local firm continues to engage in the manufacture of bay rum, but exports showed a decline and totalled only 714 gallons as compared with 963 gallons in 1936.

Vanilla.—The demand for and value of this product which revived in 1936, showed further improvement and this minor industry has again become a useful source of revenue to the peasantry, who are being encouraged to extend their cultivations. Exports, which amounted to 9,537 lbs., were more than double the quantities shipped in 1936.

Rum.—Dominica rum is a direct product of the juice of the sugar cane, and cannot therefore readily compete with that produced from by-products of the sugar factories in other parts of the West Indies, to which it was formerly exported in quantity. Exports in 1937 dwindled to 3,339 gallons, and as the growing of sugar cane is almost entirely in the hands of small growers, they have been badly hit by the big decline in exports. There is a small local market for rum and syrup, but supplies far exceed the demand and prices have been such as to yield very poor returns to the growers.

In view of the glut in syrup, one planter made trials with the preparation of fancy molasses along the lines kindly recommended by the departments of agriculture in St. Vincent and Barbados, and although he produced a satisfactory article, the price obtainable did not leave a margin of profit over the costs of production, mainly because the recovery of juice is unsatisfactory with the type of mill used.

Tobacco.—Interest in this crop and the production of tobacco products, both for local sale and for export, is displayed by one large estate. Pipe tobacco, cigars and cigarettes are made and exports were in excess of those made last year.

Vetiver.—An outlet for the dried roots of Vetiver is still being sought, and the Imperial Institute has again given valuable assistance in this respect. During the year a commercial consignment was forwarded to the Institute, but on distillation yielded only a small percentage of oil at a time when the market was depressed. (See Appendix IV.) In view of this result, a local exporter is making trial distillations on the spot and hopes to determine thereby the age of plants at which the roots yield the maximum quantity of oil, and best type of soil.

Derris.—The cultivation of Derris species and varieties has been continued on one estate and specimens of the dried roots were forwarded to the Imperial Institute for examination. (See report reproduced in Appendix V.) Further importations of planting material were made by the department on behalf of the planter in question.

3. TABLE OF EXPORTS FROM DOMINICA FOR THE TRIENNIAL PERIOD 1935 TO 1937.

	1935.		1936.		1937.	
	Quantity.	F.O.B. Value £	Quantity.	F.O B. Value. £	Quantity.	F.O.B. Value. £
Lime Products:						
Concentrated Juice ...	3,372 gals.	184	2,783 gals.	198	1,735 gals.	130
Raw Juice	48,074 ,,	2,002	88,460 ,,	3,686	110,765 ,,	4,679
Lime Juice Cordial ...	-	--	—	—	49 ,,	5
Distilled Oil	7,127 lbs.	7,443	9,189 lbs.	9,612	8,213 lbs.	7,057
Ecuelled Oil	140 ,,	186	350 ,,	565	11 ,,	14
Oils in Solution ..	567 ,,	589	1,144 ,,	1,156	2,101 ,,	2,208
Green Limes	4,035 brls.	6,123	3,555 brls.	5,518	4,450 brls.	6,643
Pickled Limes	207 ,,	474	140 ,,	352	110 ,,	263
Other Fruits and Allied Products:						
Oranges	10,746 crates	5,773	12,754 crates	7,319	14,021 crates	7,058
Orange Oil	1,131 lbs.	235	70 lbs.	14	663 lbs.	159
Grapefruit	5,386 crates	2,596	3,038 crates	1,586	4,375 crates	1,871
Grapefruit Juice ..	329 gals.	31	2,143 gals.	199	4,331 gals.	377
Bananas	71,527 bunches	5,780	99,858 bunches	8,391	114,812 bunches	10,658
Mangoes	3,462 crates	1,363	8,616 crates	3,164	6,056 crates	2,478
Avocado Pears... ...	3,726 ,,	744	5,158 ,,	1,171	4,845 ,,	719
Miscellaneous		224		249		535
Cocoa Products:						
Cocoa, Raw	344,156 lbs.	3,459	354,578 lbs.	4,168	274,108 lbs.	4,983
Cocoa, Prepared ...	1,032 ,,	15	1,161 ,,	25	786 ,,	24
Coconut Products:						
Copra	278,793 lbs.	1,066	273,612 lbs.	1,497	116,016 lbs.	773
Coconuts	230,170	452	719,554	1,991	1,046,312	3,271
Sugar Products:						
Rum	10,179 gals.	1,428	3,090 gals.	424	3,339 gals.	480
Bay Products:						
Bay Oil	16,474 lbs.	2,421	21,282 lbs.	3,229	19,635 lbs.	2,945
Bay Rum	516 gals.	92	963 gals.	168	714 gals.	147
Spices:						
Vanilla	609 lbs.	153	4,341 lbs.	868	9,537 lbs.	4,047
Nutmegs		6	310 ,,	7	—	—
Ginger		9	2,094 ,,	25		5
Other Products:						
Coffee	859 lbs.	22	728 lbs.	14	1,509 lbs.	27
Vegetables		35		56		183
Farine		14		6		27
Hides and Skins ...		1		—		19
Leather, Unmanufac/d		63	2,284 lbs.	92		101
Turtle Shells		26	127 ,,	45		91
Baskets		11		10		7
Tobacco, Cigars & Cigarettes	6,568 lbs.	495	3,156 lbs.	200	4,954 lbs.	299
Miscellaneous		352		200		467
Forest Products:						
Hardwood	95,407 ft.	537	131,638 ft.	710	94,451 ft.	454
Firewood	46 cords	10	192 cords	71	229 cords	74
Canoe Shells	7	7	14	28		18
Shingles		2		—		3
Charcoal		12		23		15
Locally made boats ...		456	158	632		456
Value of Local Exports ...		44,891		57,669		63,770
Total Re-Exports ...		12,595		12,300		9,291
Value of Total Exports ...		£57,486		£69,969		£73,061

NOTE. 1. Various sized packages are used in the export of fruit and exports given above are converted to the most common pack.

2. The areas under various crops cannot be given owing to a preponderance of peasant holdings and numerous small estates having no pure stand of any one crop.

SECTION II.

WORK OF THE DEPARTMENT.

1. THE BOTANIC GARDENS.

The Botanic Gardens, which cover an area of approximately 44 acres, have practically recovered from the devastating effects of the hurricanes of 1926, 1928 and 1930, and although a number of old specimens have gone past their best, the gardens have regained their former attractive appearance.

Decorative Section.—This section of the gardens was maintained in good condition throughout the year and continues to attract large numbers of visitors. Considering the long dry season and the inadequate rainfall experienced during most of the wet season, young specimens planted in recent years made fairly good growth, though many required very careful attention and frequent watering.

The ordinary routine work was carried out as usual. This included the provision of pitches on the main lawn throughout the cricket season, the care of other lawns, trees and hedges, and also attention to buildings, walls, gates and fences.

The policy of replacing old, unsightly or otherwise unsuitable specimens by planting replicates and new introductions was proceeded with. In this work care is taken not to interfere with the large stretches of lawn or the grass drives which are such a feature of the gardens, and to ensure as far as possible that new plantings shall tone in with their surroundings. Most attention was paid to the southern end of the gardens, where the hurricanes had seriously depleted the number of specimens, and also to the western portion adjacent to the Convent.

The Memorial Park, Library Gardens, Morne Bruce Lands and Old Military Cemetery, which are attached to the department for upkeep, were maintained in as good condition as funds permitted.

Economic Section.—Practically two-thirds of this section has been remodelled in recent years and during the current year the policy has been to concentrate on the newly planted plots with a view to hastening their progress. Consequently, with the exception of supplying failures in the young plots, no new plantings were made :—

The following table shows at a glance the chief contents and condition of the economic plots in 1937 :—

Plot.	*Main Crop.*	*Date Planted*	*Catch and Cover Crops.*	*Remarks.*
1 A	Avocado Pears and Tangerines	1932	*Crotalaria valetonii*	Bearing well
1 B, C, D.	Citrus varieties	1932–3	*Indigofera endecaphylla*	Commenced bearing
2 A	do. do.	1929	*Tephrosia vogelii*	Bearing well
2 B	Lime varieties	1935	*Tephrosia candida*	Commenced bearing
3	Trinidad Cacao	1934	*Tephrosia* and *Cocoyes*	Commenced bearing
4	Kola	1900	Pepper and Vanilla	Full bearing
5	Grafted Cacao	1906	Para rubber	do. do.
6	Local food crops	Annually	Various legumes	For pupils' instruction
7	Nutmegs	1933	*Tephrosia candida*	Growing well
8	Tonka Beans	1935	Bananas	Very slow growth
9	Citrus varieties	1894	Clean weeded	Due for replacement
10	Hydnocarpus	1928	*Canavalia ensiformis*	Full bearing
11	Nutmegs	1931	Dwarf bananas	Commenced bearing
12	Citrus varieties	1929	*Tephrosia candida*	Bearing well
13	Trinidad Cacao	1934	*Tephrosia* and *Cocoyes*	Commenced bearing
14	Citrus, etc.	1894	Clean weeded	Due for replacement
15	Coffea varieties	1934	*Gliricidia* and *tephrosia*	Uneven growth
16	Citrus and Hydnocarpus	1922–7	*Canavalia ensiformis*	Bearing well
17	Lime varieties	1935	*Indigofera* and bananas	Commenced bearing
18	Mixed economic plants	1906	Clean weeded	Due for replacement
19	Cacao and oranges	1894	Bananas	do. do.
20	Grafted mangoes	1902	Turf	do. do.
21	Cacao	1894	Para rubber	do. do.
H.S.1(a)	Trinidad Cocao	1935	Bananas, *gliricidia*	Good progress
,, (b)	Grafted Mangoes	1936	Lemon grass	do. do.
H.S.2	Pimento	1928 & 1935	Guinea grass	do. do.
H.S.3	Trinidad Cacao	1936	*Gliricidia* and *tephrosia*	do. do.

Plots 1 to 21 are on comparatively flat land in the main economic section, plots H. S. 1 to H. S. 3 being on hillsides. There are several other hillside plots not numbered, containing principally old cacao, grafted mangoes and forest trees. It is proposed to replant some of these as funds permit, and also plots on the flat which are marked in the table "Due for replacement," since they have been rendered unsightly and uneconomic by hurricanes and are also generally suffering from the effects of old age.

The usual routine was carried out throughout the section and records were kept of manurial and cultural treatments, as well as of crop yields. In addition, costings were kept for each plot in order to facilitate economical working, to show the cost of the various treatments and to provide statistical information as to the cost of bringing crops into bearing and the returns from plots in full bearing.

Nursery.—A small pot nursery is maintained for the propagation of plants of general or scientific interest, chiefly to meet the needs of the Botanic Gardens, and a small surplus

of plants is available for sale or exchange. Seeds are raised in boxes in glass houses and cuttings in beds. When sufficiently advanced, the plants are transferred to bamboo pots and grown under shade in the pot nursery shelter. Economic plants such as nutmegs, budded cacao and avocado pears are also raised in this nursery.

Plant and Seed Exchange.—Contributors of planting material included H.G.W. Pascoe, Esq., of Jamaica; The Director, Canal Zone Experiment Gardens, Summit, Canal Zone; Coconut Grove Palmetum, Florida; Department of Agriculture, Bermuda; S. Haweis, Esq., and Hon. Capt. W.J.R. Stebbings, Dominica; Commonwealth Forestry Bureau, Canberra. Australia; Advisory Department, Imperial College of Tropical Agriculture, Trinidad.

Recipients of plants or seeds of ornamental species included L.H. Bailey, Esq., Cornell University, U.S.A.; Department of Agriculture, Barbados; Miss M. Nicholls and Mr. J. Archbold, Dominica; Mr. Hart, St. Croix, Virgin Islands, U.S.A.; Mr. A. Gordon, Jamaica.

2. PLANT DISTRIBUTION.

The number of plants distributed during the year was the lowest in any year since the commencement of the Plant Distribution Scheme in 1927. The chief reason for this was the curtailing of funds provided for the propagation of plants last year and the reduction of the area planted with citrus stocks.

In addition, weather conditions during the past eighteen months have been anything but favourable for large scale nursery work. From July 1936 to January 1937, plants in beds were adversely affected by unusually heavy downpours, which resulted in excessive washing, leaching and compacting of the soil, so that growth in all stages of their development was seriously retarded. Wholesale losses due to damping-off occurred amongst stocks in seed beds and scab was unusually severe in the older transplanted stocks, which lowered their vitality and prevented their being budded till nearly three months later than usual.

In February, the weather turned dry and a period of drought lasting late into June ensued. Even after the rains began, the precipitation was abnormally low and the temperature high, which further retarded the growth of the plants, already backward and lacking in vigour from the above causes. In consequence, the number of citrus plants available for distribution was insufficient to meet orders given by planters in the previous year.

The outlook for 1938 is much more hopeful. Owing to the funds for this work having been increased from £300 to £500, it has been possible to bed out a much larger number of stocks than in 1936, and it is anticipated that, given reasonable conditions, all ordinary demands will be met next year, as judged by orders booked and awaiting completion.

Reference to the table of plants distributed will show that the citrus plants in chief demand are West Indian limes and Washington Navel oranges. The demand for other budded oranges and grapefruit has gradually declined, and these varieties are now propagated only in relatively small numbers. There was some demand for sour orange and grapefruit stocks for supply to private nurseries and increased sowings have been made to cater for this demand. Renewed interest is being displayed in seedling cacao, and also budded and grafted avocado pears and mangoes, though not to the extent of former years.

Seeds and cuttings of cover crops and mulch plants are seldom required, since planters have had ample opportunity of establishing their own sources of supply.

Onion and cauliflower seed was distributed as usual. Reliable seeds of other vegetables are obtainable at the local stores and are therefore not stocked by the department.

Expenditure on nursery work and plant distribution in 1937 amounted to £500. 0. 0 and receipts for plants sold to £168. 12. 6, including the collection of outstanding debts.

The following tables show the variety and numbers of plants annually distributed during the past three years, and totals since the commencement of the Plant Distribution Scheme in 1927.

Budded or Grafted Fruit Trees.

Name of Plant.	*Total for 8 years 1927–34.*	*Total for 1935.*	*Total for 1936.*	*Total for 1937.*	*Total for 11 years 1927–37.*
Washington Navel Orange	11,234	1,103	1,767	1,817	15,921
*Oranges (Other)	4,139	2,391	679	283	7,492
†Grapefruit	29,588	4,334	796	412	35,130
Portugal Orange	233	21	25	1	280
Mandarin	316	16	25	—	357
Sweet Lime	217	23	21	—	261
Tangerine	401	26	34	—	461
West Indian Limes	122,742	9,194	3,928	3,327	139,191
Limes (Other varieties)	5,607	269	412	—	6,288
Lemons	4,089	—	—	—	4,089
Avocado Pears	339	120	27	91	577
Mangoes	1,501	140	94	73	1,808
	180,406	17,637	7,808	6,004	211,855

*Principally "Valencia."

†Chiefly "Marsh."

Other Economic Plants.

Name of Plant.	*Total for 8 years. 1927–34.*	*Total for 1935.*	*Total for 1936.*	*Total for 1937.*	*Total for 11 years 1927–37.*
Seedling Limes	41,720	—	—	—	41,720
Sour Orange	30,698	824	—	1,050	32,572
Coconuts	33,004	—	—	—	33,004
Cocoa	48,584	204	647	764	50,199
Coffee	129,629	1,447	6	12	131,094
Seedling Mangoes	256	—	—	—	256
Nutmeg	12,469	125	1	99	12,694
Tobacco	6,382	—	—	—	6,382
Mangosteen	360	26	—	—	386
Seedling Avocado Pears	321	—	—	—	321
Papaw	2,429	—	—	—	2,429
Tannias	31,670	—	—	—	31,670
Camphor	363	—	—	—	363
Black Pepper	1,037	30	—	—	1,067
Onions	54,637	—	—	—	54,637
Bananas	4,896	612	—	—	5,508
Sugar Cane Cuttings	26,643	—	—	—	26,643
‡Miscellaneous	75,414	1,679	404	2,353	79,850
	500,512	4,947	1,058	4,278	510,795

‡Includes cuttings and plants for cover crop and mulch purposes.

3. EXPERIMENT STATION.

In these trial grounds plots of permanent crops, principally limes, are laid out mainly for demonstration purposes, and the budded lime trees planted in 1929 and subsequently to demonstrate the value of good cultural methods continue to increase in vigour and are giving particularly good crops for trees of their age. The total yield of fruit in 1937 was 747 barrels from an area of approximately just over 10 acres, as compared with 819 barrels in 1936, but there was a large carry-over of fruit on the trees at the end of the year to counter-balance this apparent decrease. The crop was in fact much later than usual and there were two peaks, one in September and a higher one in December. The lateness of the crop was due partly to showery weather inducing a good deal of Withertip and Blossom Blight (*Glœosporium limetticolum*) early in the year and the hot dry weather subsequently, which apart from very short periods of adequate rainfall, was experienced throughout the greater part of the year.

For the purpose of facilitating economical working and later, to provide statistical information as to the cost of lime production, detailed costings are being kept for each individual plot. Records are also kept of manurial treatments. The lime trees in all plots receive applications of fish manure (5-10-10) and sulphate of ammonia in the proportions of approximately 5.1 in gradually increasing doses as they develop; two-fifths of the fish manure and all the sulphate of ammonia being applied in May and June, and the balance of the former in November and December.

A number of the plots are cover-cropped with *Tephrosia candida*, either completely or in belts to form temporary windbreaks, to improve soil conditions and to help control soil erosion. As most of the plots are on hillsides having a considerable slope, they are contour drained and lemon grass is planted above the drains, which further minimises soil wash and forms a support for terracing. Very steep hillsides are planted in lemon grass and *Gliricidia* to provide material for mulching additional to that supplied when the cover crop is topped, there being no pen manure available for keeping up the supply of humus.

Trials of Stocks for Limes.—Plots 1, 2 and 3 are each divided into three sections to provide a triplicate series of rootstock trials for budded limes, the stocks used being rough lemon, grapefruit and sour orange. The trees were planted in 1930 and number 77 in each group of stocks, covering an area of approximately eight-tenths of an acre for each series. The yields recorded to date are as follows:—

Plots 1, 2 & 3. Yields to the nearest Half-Barrel.

Year.	*Rough Lemon 1A, 2A, 3A.*	*Grapefruit. 1B, 2B, 3B.*	*Sour Orange. 1C, 2C, 3C.*	*Totals.*
1932	0½	1	1	2½
1933	6	10	6	22
1934	15½	18½	16	50
1935	48	53	47	148
1936	72½	87	67½	227
1937	62	76½	66	204½
Total, 6 years	204½	246	203½	654

Old Budded Lime Trees.—Plots 4 and 5 contain limes budded on sour orange stock which are now twenty-four years old. In 1921-22 the combined yield of these plots approximated 241 barrels of fruit per acre, but a gradual reduction in yield followed the appearance of withertip disease in 1922, which was accentuated by damage done to trees by the hurricanes of 1926, 1928 and 1930. The effect of this damage is still evident and most of the trees are showing signs of age, though yields are profitable. Plot 5 suffered most but has the advantage of a deeper soil and only a gentle slope. In recent years a few trees which died were replaced, but the young plants are not yet bearing any appreciable quantity of fruit.

The calculated yields per acre for the past six years in barrels were as follows, decreases in 1937 being partly attributable to the above cause :—

Plot No.	*1932*	*1933*	*1934*	*1935*	*1936*	*1937*
4	113	79	121	155	147	115
5	182	86	123	200	225	106

The yields in 1937 are equivalent to 135 and 208 barrels per acre respectively, both considerably higher than estate yields from seedling trees in pre-withertip days and indicative of the greater productiveness of budded trees.

Budded versus Grafted Limes.—Plot No. 6 is divided into two sections, one section containing grafted and the other budded limes, sour orange being the stock used in each case. The trees were planted in 1929 and the grafted trees have consistently given better yields. Their yield in 1937 was at the rate of 86 barrels per acre and from the budded trees 51 barrels per acre, as compared with 132 and 69 barrels respectively in 1936.

Other Plots of Budded Limes.—Plots 7 - 11 containing limes on sour orange were planted in 1930-31 and the trees are bearing very good crops for their age. They serve to demonstrate various methods of cultivation as applied to hilly land of varying gradients and with trees at different distances apart. The actual yields in the past four years were 43, 226, 302 and 287 barrels from an area of 5.84 acres.

Shade Trials for Limes.—In view of the diversity of opinion concerning the influence of overhead shade in relation to the bearing qualities of lime trees in withertip disease areas, plot No. 18 was planted in 1936 with limes budded on sour orange stock for observation purposes in this connection. This plot, which has an area of 1.46 acres is divided into four sections. Two sections are planted with the following shade trees : *Adenanthera pavonina* in 18A and *Peltophorum ferrugineum* and *Cassia Siamea* alternately in 18C, and the lime trees in the remaining two sections are being grown without shade for comparison. Both lime and shade trees have made excellent progress.

Seedless Limes.—Plot 19 was planted during the year with 28 trees each of Bear's Seedless and Tahiti limes, which besides being virtually seedless are highly resistant to withertip. Both varieties have proved shy bearers on sour orange stock but are reputed to do well on sweet orange, and since the latter is very subject to foot rot in Dominica, the plants were raised by top-working the seedless limes on Valencia orange plants budded on sour orange. The young plants were checked by hot, dry weather after planting, but are now recovering and beginning to grow.

Top-working of Grapefruit Trees with Limes.—This trial was undertaken to ascertain whether the heavy yields of limes on grapefruit stock already referred to can be combined with the resistance of the sour orange stock to root troubles. With this object in view fifty-five trees raised by top-working limes on seedy grapefruit budded on sour orange were planted in plot 9C in 1936, and the trees have grown well.

Top-working of Lime Trees with Grapefruit.—Most of the grapefruit trees obtained by top-working limes budded on sour orange *in situ* in 1934 have borne fruit and a few trees on rough lemon and grapefruit stock which were similarly treated in 1935-36 have also borne. Plot 8B contains sixteen trees, eight on rough lemon and eight on grapefruit stock and plot 9A, 34 trees all on sour orange. So far there is no marked form of incompatibility between the lime and the grapefruit and this process can be recommended for the treatment of lime trees planted in areas where there is a heavy incidence of withertip disease.

Grapefruit.—The crop from plots 12A and 12B containing grapefruit varieties planted in 1914-15 matured during the period January-March and was partly shipped to Canada and partly sold locally at an average of 3/4d. per 100 for the whole crop. The total area of these plots is .54 acres and the yield of saleable fruit averaging 70 per crate was at the rate of 420 crates per acre or about 3.8 crates per tree, an excellent yield considering the age of the trees and that many of them are suffering from gummosis.

4. PESTS AND DISEASES.

Panama Disease (*Fusarium cubense.*)—In view of the general incidence of this disease in banana cultivations in most parts of the island, an inspection service was inaugurated early in 1936 by the appointment of three inspectors whose chief duty was to continue the work of demonstrating to planters and peasants the use of gas oil for the destruction of plants attacked by Panama Disease.

Later in that year Dr. C. W. WARDLAW of the Imperial College of Tropical Agriculture visited Dominica to examine the status of this disease in relation to the commercial aspects of the banana industry and on his recommendations four additional inspectors were appointed, who, together with the original three operate in all the banana producing areas of the island, and funds have been provided for a continuation of this important work in 1938.

The following table computed from the inspectors' returns shows the estimated average monthly incidence of Panama Disease in the plots and plants inspected during the year :—

District.	*Plots Inspected.*	*Plots Infected.*	*Percentage Infected.*	*Stools Inspected.*	*Stools Infected.*	*Percentage Infected.*
Marigot	94	12	13	11,207	35	.31
Lasoye	30	8	27	4,506	56	1.24
Portsmouth ..	41	11	27	6,278	50	.80
Colihaut	39	9	23	8,120	30	.37
St. Joseph ..	77	12	15	5,403	40	.81
Roseau	89	18	20	10,994	217	1.97
South & S. E. ..	64	27	42	6,910	186	2.69
ALL DISTRICTS ..	432	96	22	53,043	615	1.16

These figures compare very favourably with those for 1936 when the average number of plots infected was 29%, with a percentage stool infection of 1.58% for all districts.

It should be clearly understood, however, that the actual incidence of disease throughout the whole island is higher than the figures for the two years cited indicate, since they refer only to areas still in economic production, and do not include lands completely abandoned or those where infection is beyond economic control. The quarantine measures adopted for such areas are referred to later. In this connection, paragraph 5 of Dr. WARDLAW'S report, which was re-printed in full last year, may be quoted :—

> "In the writer's opinion, a survey of the heavily-infected areas should be undertaken at once, and quarantine measures put into operation where necessary, so that no planting material of any kind can be removed. Appropriate legislation is already in existence. With such bad areas defined and eliminated once and for all, the task confronting the Department will be to control the relatively light infections present on the new and productive areas."

Under the Plants Protection Ordinance, No. 2 of 1927, and in accordance with the above recommendation, notices are served on the occupiers of plots containing 10% or more diseased banana stools forbidding them to remove planting material from affected areas. During the two years 74 and 26 plots have been thus quarantined and their sites indicated on a map for departmental reference. This map also shows the position of all banana cultivations, their approximate extent and the state of the roads and tracks giving access to them.

In view of the potential danger to other cultivations of the abandonment of the above-mentioned quarantined areas, the department proposes to take more drastic action in future. It is now realised that under Dominica conditions, the declaration of quarantine is not in itself a sufficient safeguard owing to the extreme difficulty of its enforcement, and that the only safe method is to destroy all diseased plants for the benefit of the industry as a whole, even where such a method is not economic in the case of a particular plot or plots.

Bacterial Wilt (*Bacterium solanacearum.*)—This disease, which is similar in its effects to Panama Disease, though less virulent under Dominica conditions, is also present in several localities and the same measures are being taken for its control.

Banana Borer (*Cosmopolites sordidus.*)—Many banana growers do not take this insidious pest as seriously as they should and consequently in cultivations several years old, the reduction in crop is sometimes nearly as great as that caused by Panama Disease. The borers are present in most banana cultivations in some degree and regular trapping and field sanitation are being advocated, these methods having proved adequate in the department. The growing of sweet potatoes as a catch crop for bananas is being discouraged since they tend to harbour and multiply the borers.

Withertip Disease (*Glœosporum limetticolum.*)—The efforts made to raise a hybrid lime resistant to this disease, yet possessing the properties of the West Indian lime were continued. Early in the year the seedlings obtained last year from back-crosses of selected lime hybrids of high resistance were budded on grapefruit stocks in duplicate, 98 budded plants being so raised, representing 54 different seedlings. The plants are closely spaced in nursery beds in an an attempt to induce early fruiting in order to eliminate those with undesirable characteristics. The remainder will then be retained for further trial.

Disease of Vanillas.—A disease causing blackening and dropping of the pods which occurred on one estate in August and September was controlled by two applications of Bordeaux mixture. Specimens sent to the Imperial College of Tropical Agriculture arrived too decomposed to permit of identification of the microorganism responsible.

Sigatoka Disease (*Cercospora musæ.*)—This leaf spot disease of bananas having caused much damage in Trinidad and other West Indian islands, the banana inspectors were made familiar with the symptoms and instructed to keep a sharp look out for its appearance, and the steamship company requested to pay close attention to sanitation in banana holds. An outbreak of this disease was discovered in February 1938. (See Appendix VII.)

Gummosis.—While this disease is not present on a scale sufficiently large to occasion serious alarm, yet it is ubiquitous and few cultivations are entirely free. Planters have been warned of the dangers of the disease and the desirability of prompt treatment in the early stages. This consists in cutting above and around gum patches and thoroughly scraping until the underlying wood is white, not brown, followed by the application of a suitable wood preservative or Bordeaux paste. Tar is not considered very satisfactory for the purpose, since it tends to prevent the healing up of the wounds. In the case of severe attacks of the disease, the planting of several large sour orange stocks for inarching often prolongs the life of a valuable tree, but young trees badly attacked should be replaced.

Visit of Entomologist.—Mr. R. G. FENNAH of the Imperial College, who is engaged in investigational work on citrus pests in the Leeward and Windward Islands, paid two visits to Dominica, one in September and a second in December. Special attention was paid to citrus weevils, bark borers of lime trees, and oranges damaged by caterpillars and other pests. In none of these cases was damage found to be very extensive. Mr. FENNAH'S report is reproduced in appendix VI.

5. AGRICULTURAL INSTRUCTION AND ADVISORY WORK.

Pupils.—With the extension of budded citrus and banana cultivations amongst the peasantry, the need for a more widespread knowledge of modern agricultural methods becomes more and more evident, and during the year 1937 the training of pupils recruited largely from the better class peasantry was again one of the most important duties carried out by officers of the department.

The pupils undergoing training during the current year averaged sixteen in number, as compared with eleven in the previous year, the reason for this increase being the extension of nursery work, and in particular the propagation of citrus, the principal work in which they engage. As a result of the annual entrance examination four new pupils were selected and also three unpaid probationers. So keen was the competition for vacancies that no less than 56 boys applied for permission to sit the examination and several applicants were willing to work without the usual subsistence allowance for the privilege of receiving training.

Although the pupils spend much of their time on propagation work, it has always been the aim of the department in giving practical and theoretical instruction to impart to them

a broad knowledge of general agriculture suitable to the circumstances of the island. With this aim in view, pupils are given work in all sections of the department where practical agriculture is carried out, namely the Experiment Station, the Economic Plots and the Government Fruit Farm Field operations in which they assisted included clearing land, planting and tending young trees, weeding, establishing cover crops and wind breaks, draining, and fencing; also the harvesting of cocoa, limes, bananas, and other crops, and the control of pests and diseases.

Senior pupils were again engaged on special duties throughout the year, which included the supervision of labour, the keeping of cost accounts and the compilation of statistics therefrom. This work not only teaches methods of recording expenditure and returns, but also gives an insight into the economical employment of labour and the cost of carrying out various operations.

All pupils and probationers attended lectures and demonstrations on Friday afternoons and Saturday mornings and also on other occasions as circumstances permitted. Whenever possible, practical work in the field was given as a basis for theory taught in the classroom. Pupils were required to write a summary of all lectures, thereby providing themselves with useful notes for future reference. The lectures were given and books corrected by the Assistant Agricultural Officer who, with the help of a Head Pupil, is responsible for their training. The syllabus given in last year's report was adhered to with minor amendments.

Grammar School Boys.—In connection with a theoretical course of crop and soil science given in school, boys of the upper forms of the Grammar School attended at the department fortnightly during school term and were instructed in practical operations. Demonstrations were first given in the experimental plots and were followed by notes in the classroom on the principles underlying the various operations. The syllabus followed was that of the Cambridge Local Examination Syndicate. It is hoped in this way to induce a larger number of boys ultimately to take up agriculture as a profession, either on their own properties or as settlers at the Government Fruit Farm.

Banana Inspectors.—Two senior pupils were given a special course of instruction in banana growing in all its phases. One of the new instructors was appointed to relieve the Senior instructor in the Southern district to enable him to do more general agricultural work and the other to replace one of the assistant inspectors who retired.

Instruction in Country Districts.—Agricultural instruction amongst the peasants, formerly undertaken by the Travelling Agricultural Instructor whose post was abolished in 1936, was again undertaken by the two Senior Banana Inspectors. The Assistant Inspectors also devoted some of their time to crops other than bananas, and in particular assisted peasants in raising budded citrus plants in their own nurseries. They also gave assistance with the top-working of undesirable types of citrus trees on estates, and advice to managers of school gardens.

Advisory Work.—The senior officers of the department paid visits to estates and maintained close contact with members of the planting community. Agricultural problems were discussed on the spot and advice was given on cultural and other problems affecting any particular estate. Planters were also accorded interviews at headquarters and given an opportunity of inspecting the demonstration and experimental work of the department.

The thanks of the department are extended to those planters who generously afforded visiting officers their usual kind hospitality and in many instances supplemented existing facilities for travelling.

Estates in receipt of government loans were inspected and reports submitted. The Agricultural Superintendent is a member of the Loans Investigation Committee which meets frequently to advise the Government on matters of policy in connection with loans. Reports were also furnished at the request of the Banana Association in respect of certain properties for which applications had been made for advances for cultivation.

The department continued to work in close collaboration with the Imperial College of Tropical Agriculture, Trinidad, and the Commissioner of Agriculture and members of his staff paid periodical vists to Dominica for the purpose of discussing and advising on local agricultural problems. The usual assistance in the determination of pests and diseases and advice on other matters was also freely given by Officers of the College from time to time.

The Fruit Trade Committee met as circumstances demanded to consider and make recommendations on matters affecting the fruit export trade. The Agricultural Superinten-

dent is deputy chairman and the Officer-in-Charge of the Government Marketing Depot secretary of this body. Mr. C. R. Stollmeyer, Canadian Trade Commissioner, addressed a meeting of the Committee in October and suggested various measures likely to accelerate progress.

Two delegates from Dominica attended the 2nd meeting of the British West Indian Fruit and Vegetable Council held in Trinidad in February, viz. Mr. I. N. Shillingford and Mr. H. B. Pidduck, Assistant Agricultural Officer.

The thanks of the department are due to Mr. C. T. Watts, Engineer of the Imperial College of Tropical Agriculture, who on several occasions inspected the cold storage plant and made valuable recommendations for its maintenance and economical running.

The Agricultural Advisory Committee appointed under Ordinance No. 6 of 1935 to advise the Government on matters of policy pertaining to agriculture met periodically during the year and meetings were well attended. The Agricultural Superintendent is Chairman of the Committee and the Assistant Agricultural Officer, headquarters, performs the secretarial work. These officers were also elected to similar positions on the committee of the Dominica Lime Growers Association.

6. CORRESPONDENCE.

Three hundred and seventy-five letters were despatched and three hundred and sixty-nine Minute Papers dealt with, in addition to numerous Confidential Minute Papers. Various agricultural and meteorological returns and departmental progress reports were prepared and submitted periodically. Copies of pamphlets and reports on general agriculture were distributed locally to persons interested.

7. LABORATORY.

A small laboratory is maintained for the purpose of the simple examination and analysis of commercial products, and during the year the chief tests made were as follows :—

Raw Lime Juice	17
Bay Oil	213
Milk	33

8. STAFF NOTES.

The Hon. F. G. HARCOURT, Agricultural Superintendent, was appointed to act Administrator from 22nd February to 7th March, and again from 22nd March to the 25th July, from which date His Honour was temporarily transferred to Montserrat as acting Commissioner until the end of the year.

Mr. H. B. PIDDUCK, Assistant Agricultural Officer, acted Agricultural Superintendent from 22nd March to 29th May, and from 19th September to the end of the year, taking overseas leave in the interim.

Mr. W. E. BASSETT, Assistant Agricultural Officer, acted Agricultural Superintendent from 26th July to 18th September, in conjunction with his usual duties as Officer-in-Charge, Government Marketing Depot and Manager, Government Fruit Farm.

Mr. W. R. E. NANTON of Antigua was appointed Temporary Junior Assistant Agricultural Officer on the 25th July.

Mr. G. A. WINSTON, Clerk, Government Marketing Depot was seconded for duty in various departments on several occasions and Mr. J. B. BULLY of the Treasury Department acted. From 31st October to the end of the year Mr. WINSTON was seconded to the Treasury and Mr. R. L. BLANCHARD took his place at the Depot.

All members of the Junior Staff took local vacation leave during the year.

Mr. M. D. EDWARDS resigned his post as Assistant Banana Inspector on the 23rd December and Mr. WILLIX COIPEL was appointed in his stead.

SECTION III.

FINANCIAL STATEMENT.

Expenditure and Revenue.—Statements of expenditure and revenue with regard to special services are given in the appropriate sections of the report. Expenditure, other than on special services, and the general revenue of the department were as follows :—

Expenditure.

	£	S.	D.
Personal Emoluments	1,115.	7.	1
Contingencies	9.	14.	6
Maintenance of Botanic Gardens	269.	17.	4
Cultivation of Demonstration Plots, &c.	234.	2.	0
Purchase of Special Manures	49.	16.	11
Experiment Station	335.	0.	0
Upkeep of Morne Bruce Lands & Military Cemetery	19.	19.	5
Chemicals & Apparatus	9.	13.	0
Upkeep of Horses & Mules	28.	13.	11
Tools and Equipment	57.	13.	4
Banana Disease Control	541.	16.	9
Agricultural Pupils	198.	11.	5
	£2,870.	5.	8

Revenue.

Limes	£265.	0.	4½
Cocoa	16.	11.	0½
Fruit	51.	0.	5½
Onion Seed	8.	9.	8
Laboratory Receipts	16.	15.	6
Miscellaneous	9.	16.	3½
	£367.	13.	1

SECTION IV.

LEGISLATION AFFECTING AGRICULTURE.

The following legislation affecting agriculture came into force during the year 1937 :—

A Proclamation dated 1st June made under the Plants Protection Ordinance, No. 2 of 1927, prohibited the importation of all citrus fruit from the United States of America.

Ordinance No. 7 of 1937 amended the schedules to the Customs Import and Export Tariff Consolidation Ordinance No. 11 of 1930.

Ordinance No. 12 of 1937 amended the Tonnage Dues Ordinance, No. 25 of 1925, to include firewood, green vegetables and fresh fruit amongst the exports on which tonnage dues are payable.

Statutory Rules & Orders, No. 3 of 1937, made under the Plants Protection Ordinance, No. 2 of 1927, prohibited absolutely the importation of cotton seed, lint, seed cotton and packages in connection therewith from Cuba, Haiti and Santo Domingo.

APPENDIX I.

Report of the Manager, Government Fruit Farm, Copt Hall.

1. **Staff.** Mr. W. E. BASSETT was Manager of the Government Fruit Farm, Copt Hall, and Mr. A. C. WINSTON, as Foreman's Deputy, carried out the duties of Foreman, throughout the year.

2. **Progress.** In some sections of the farm the citrus trees increased considerably in size, but the rate of growth generally was slow. The "Marsh" grapefruit trees planted as fillers in the grapefruit sections of the Land Settlement Plots during the past three years are developing satisfactorily, and most of the fillers in the orange sections have also made fair growth. Many of the earlier planted trees bore small crops of fruit, of which the best was packed for export. As was to be expected with a first crop, much of the fruit was coarse and rather sour, and was unsuitable for shipment abroad. Of the grapefruit trees which have fruited, a rather large proportion produced seeded fruit.

3. **Planting.** A demonstration plot, used until recently as a trial ground for hybrid lime trees, was planted during the year with "Marsh" grapefruit and "Washington Navel" and "Valencia" orange trees, thus virtually completing the permanent planting of the estate. It is estimated that the total area planted with citrus trees is 100 acres.

4. **Windbreaks.** Regular attention was given to the cultivation of the extensive system of windbreaks now established on the farm, and the system was extended in several plots by additional plantings of *Inga laurina*. Trees of this species planted during recent years made satisfactory development, but are still too small to be of much value in protecting the citrus trees from wind, and *Tephrosia candida*, *Cajanus Cajan* and *Gliricidia maculata* were cultivated on a large scale to provide temporary shelter.

5. **Manuring.** As a result of soil analyses carried out last year by Professor Hardy of the Imperial College of Tropical Agriculture, the use of fish manure and sulphate of ammonia has been discontinued, and mixtures containing large proportions of phosphates were applied twice during the year. Three plots also received dressings of lime.

6. **General Cultivation.** Windbelts and wide circles around the citrus trees were weeded and the space between the trees cutlassed sufficiently often to keep the growth of climbers and other rank weeds in check. Lemon grass was freely applied as mulch to windbelts and citrus trees.

7. **Draining.** Additional drains were made and existing drains were deepened or extened in several plots. The whole drainage system was maintained in good order throughout the year.

8. **Estate Roads and Tracks.** Work on the improvement and extension of roads and tracks giving access to plots, was carried out whenever labourers could be spared from ordinary tasks.

9. **Expenditure.** Expenditure during the year was as follows:—

Head VII (2) A.			
Personal Emoluments	£378.	16.	5
Annuity to previous owner	75.	0.	0
Tools	4.	16.	3
Estate Development and Maintenance ..	458.	19.	10
	917.	12.	6
Head XV (1).			
Less Half of Manager's salary and house allowance	167.	7.	3
	£750.	5.	3

10. **Revenue.** Revenue received from the sale of fruit was £4. 6. 4.

W. E BASSETT,
Assistant Agricultural Officer.
Manager, Government Fruit Farm.

APPENDIX II.

Report of the Officer-in-Charge, Government Fruit Packing and Marketing Depot.

Staff.—Mr. W. E. BASSETT was Officer-in-Charge throughout the year. Mr. G. A. WINSTON was Clerk, but on account of leave and temporary transfer arrangements, Mr. J. B. BULLY acted as Clerk on three occasions, and Mr. R. L. BLANCHARD on one occasion during the year.

Mr. E. A. TROTTER was Foreman Engine Driver, and Ex-Sergeant J. J. MCDOWELL was Packing House Foreman.

Work of the Government Marketing Depot.--All fruit exported from Dominica, with the exception of that destined to neighbouring islands, limes shipped to the United States of America and bananas, is required by law to be packed at the Government Fruit Packing and Marketing Depot under the supervision of a Fruit Inspector. The packing depot contains citrus packing house machinery, owned by a company engaged in citrus-growing, and available for cleaning and sizing all oranges and grapefruit packed at the Depot.

A cold storage and ice-making plant, with chambers for pre-cooling fruit, is run in conjunction with the packing depot. Prior to the 1st January, 1937, the Cold Storage Depot had been under the control of the Public Works Department, and the Fruit Packing and Marketing Depot under the control of the Agricultural Department. From that date the Agricultural Department took over control of the whole establishment, with the Public Works Department acting in an advisory capacity in regard to the machinery. The new arrangement has worked satisfactorily.

The Depot offers to producers facilities for the marketing of fruit, and as will be seen from Table I considerable use is made of these facilities.

Quantities and F.O.B. Values of Fruit Packed.--Table I shows the quantities and f.o.b. values of fruit packed and marketed by the Depot, together with the quantities and values of all fruit packed. The estimates of the f.o.b. values are based on the actual returns for all fruit marketed by the Depot during the year. The number of crates packed shows an increase of 2,230 over the 20,520 crates packed in 1936, and the estimated f.o.b. value of all fruit packed shows an increase of £1,049. 18. 9 over the estimated f.o.b. value of all fruit packed in 1936.

TABLE I.

Produce.	*Size of Crate in cub.ft.*	*Packed, but not marketed by the Depot.*		*Packed & marketed by the Depot.*		*Total packed by the Depot.*	
		Quantity.	*Estimated f.o.b. value* £. s. d.	*Quantity.*	*Actual f.o.b. value* £. s. d.	*Quantity.*	*Estimated f.o.b value* £. s. d.
Oranges ..	2	860	384 18 2	8041	3693 15 8	8901	4078 13 10
Grapefruit ..	2	1179	354 2 0	2846	1132 10 9	4025	1486 12 9
Green Limes ..	¾	2512	491 19 6	1746	479 1 0	4258	971 0 6
,, ,, ..	2	430	245 12 5	--	--	430	245 12 5
Lemons ..	2	2	1 5 6	258	164 12 10	260	165 18 4
Tangerines etc.	¾	138	15 10 6	81	9 4 11	219	24 15 5
Avocado pears.	¾	2177	489 16 6	746	168 3 3	2923	657 19 9
Grafted mangoes ..	¾	395	69 2 6	191	33 12 9	586	102 15 3
Ordinary mangoes ..	2	705	220 6 3	177	55 4 8	882	275 10 11
Pineapples ..	1¼	—	—	6	1 7 5	6	1 7 5
Pumpkins ..	brls	35	18 19 2	225	121 16 2	260	140 15 4
Totals ..	—	8433	2291 12 6	14317	5859 9 5	22750	8151 1 11

APPENDIX.

Average Returns and Packing House Costs.—Table II gives the weighted average returns and packing house costs for the more important products marketed by the Depot. Here again the figures are based on all shipments made by the Depot during the year. The figures given as Packing House Costs include cost of labour and materials used in packing, pre-cooling where necessary, porterage, lighterage to steamer, Supervision Charges, Inspection Fees, Wharfage and Export Duty.

It is believed that the average net return to growers for each product as shown in Table II is more than sufficient to cover the costs of cultivation and picking and transport to the Packing Depot, with the possible exception of returns for "Triumph" grapefruit grown at considerable distances from motor roads, and involving high transport costs. Prices for most fruits fluctuated somewhat during their respective seasons and while returns were sometimes much in excess of the average, they were occasionally insufficient to cover cultivation costs. The results of the year's working should therefore have proved satisfactory to growers who were able to supply fruit regularly over fairly long periods.

Only one debit note was sent out by the Depot during the year in respect of fruit marketed by it. This was for the sum of £1. 5. 6.

TABLE II.

Produce.	*Size of crate in cu. ft.*	*Average f. o b. returns.*	*Average Packing House costs.*	*Average nett return to growers.*
Orange, "Washington Navel"	2	9/10	3/2	6/8
,, "Valencia"	2	7/4	3/3	4/1
,, "Seedling"	2	6/5	3/2½	3/2½
All Oranges	2	9/2	3/2½	5/11½
Grapefruit. "Marsh" .. .	2	9/4	3/2	6/2
,, "Triumph" ..	2	5/10	3/2	2/8
,, "Foster"	2	7/8	3/1	4/7
All Grapefruit	2	7/11½	3/2	4/9½
Green limes	¾	5/6	1/9	3/9
Lemons	2	12/9	3/3½	9/5½
Avocado Pears	¾	4/6	1/5½	3/0½
Grafted mangoes	¾	3/6	1/5½	2/0½
Ordinary ,, ...	2	6/3	2/5½	3/9½

Further details regarding net returns are included in the following paragraphs.

Oranges.—Oranges exported early in the year were mainly "Valencias" and represented the end of the 1936-37 main crop. Those shipped to Bermuda produced for growers net returns varying from 7/3 to 8/1 per crate, and those shipped to Canada net returns varying from 6/- to 6/5 per crate.

Valencia oranges of the 1937-1938 crop ripened late in the season when prices obtainable in Canada were low. Returns to growers in respect of "Valencia" oranges marketed in Canada in December ranged from 1/- to 5/6 per crate. A small shipment to Bermuda produced 9/4 per crate.

The summer crop of "Washington Navel" oranges was picked between the middle of July and early September. Fruit of this crop shipped to Bermuda brought for growers net returns ranging from 11/3 to 13/6 per crate, and that shipped to St. John, Canada, from 7/- to 10/4 per crate.

The harvesting of the main crop of "Washington Navel" oranges began in October and continued till the end of the year. Returns to the grower for fruit of this variety shipped to Bermuda were from 9/3 to 11/4 per crate.

Returns per crate for "Washington Navel" oranges shipped to St. John and Halifax, Canada, in October were very satisfactory, but declined steadily as the season advanced, mainly on account of the heavy stocking of the markets with fruit from other countries, especially Jamaica and California. Dominica orange growers received net returns ranging from 10/2 to 2/5 per crate for "Washington Navel" oranges of the main crop shipped to Canada.

Some 600 crates of "Seedling" oranges were shipped to the Depot's agent in St. John. Net returns to growers fell from 5/6 per crate for oranges of this type shipped in September to 9d. per crate for those shipped late in November.

A few crates of "Bitter" oranges sent to the Depot's agent in St. John early in the year gave net returns around 2/- per crate.

The returns for oranges quoted above refer to fruit marketed by the Depot's agents in Bermuda and Canada. About 9% of the oranges packed by the Depot in 1937 were marketed by private shippers.

Grapefruit.—Probably the most marked feature of this section of the Depot's activities in 1937 was the increased difficulty experienced in disposing of seeded grapefruit of all varieties. From the middle of October onwards reports received from the Depot's agents in Canada showed so little promise of satisfactory returns for grapefruit of the varieties "Triumph" and "Duncan" that the Depot discontinued the shipment of these fruits, although a private shipper continued to send seeded fruit to Canada on his own behalf until the close of the year. There were definite indications that even "Foster" grapefruit, a variety which has hitherto produced satisfactory returns presumably on account of its distinctive pink colour, is fast becoming as difficult to market as any other seeded variety, and small experimental shipments of "Foster" grapefruit sent to Halifax in November and December produced net returns to growers as low as 2d. per crate.

Generally, "Marsh" grapefruit met with satisfactory demand in Canada throughout the season. Prices were fair to good, except those in respect of one shipment of 18 crates sent to Halifax in early December, which arrived when the market was heavily glutted, and sold for a price insufficient to cover packing and other charges. It was interesting to observe the increased quantities of "Marsh" grapefruit brought to the Depot during the year from young cultivations.

Grapefruit, constituting the end of the 1936–1937 crop, was shipped to Canada during January and February and produced net returns per crate as follows:—"Marsh" 4/-; "Foster" 2/11 to 4/9; other seeded varieties 4d. to 1/3.

Small quantities of "Triumph" grapefruit shipped to Canada during August, September and early October produced net returns varying from 3/8 to 7/6 per crate.

"Marsh" grapefruit was regularly shipped to the Depot's agents in St. John and Halifax during the season. Net returns per crate to growers were 11/2 early in September, declining steadily to 3/3 in December, the latter figure being the poorest return to the grower for any shipment of "Marsh" grapefruit made by the Depot during the year, except for the 18 crates already mentioned.

The bulk of the "Foster" grapefruit crop produced net returns fluctuating between 2/1 and 7/2 per crate.

Green Limes.—Green limes packed at the Depot during 1937 in tomato lugs equalled approximately 639 barrels, and those packed in citrus crates equalled approximately 215 barrels, making a total of 854 barrels, or 19% of the island's green lime exports for the year. Of the green limes packed at the Depot 30% were marketed by the Depot's agent in Montreal, Canada, the remainder being marketed by private shippers. The bulk of the private shipments went to Canada, smaller quantities being consigned to Bermuda.

As has been usual in recent years, the demand for Dominica green limes in Canada declined after the end of June. The Depot made four shipments of limes during 1937, all on

consignment, and Table III gives details of these shipments, and of the returns received, net returns for limes shipped to the United States at about the same dates being given for comparison.

TABLE III.

Date of shipment.	*Quantity shipped.*	*Net return from shipment to Canada.*		*Net return from shipment to U.S.A.*
	Tomato lugs.	*Per tomato lug.*	*Equivalent per barrel.*	*Per barrel.*
16th May	350	5/3½	35/3	27/6
30th ,,	405	5/6½	36/11	23/-
13th June	500	4/3	28/4	17/-
27th ,,	491	6½d.	3/7	17/-

An analysis of the figures given in the table shows the following results :

Weighted average net return per barrel for limes shipped to Canada : 24/10

Weighted average net return per barrel for limes shipped to the United States of America calculated for the same quantities and over corresponding periods : 20/6

It will thus be seen that while the first three shipments gave very satisfactory returns, and that while the returns from the four shipments taken together compare favourably with returns for fruit shipped to the United States of America, the returns for the fourth shipment taken alone were unremunerative.

Lemons.—The quantity of lemons shipped from Dominica in 1937, although small, shows a fair increase over that of the previous year. The bulk of the 1937 lemon crop was packed between the middle of August and the middle of November, and was shipped to St. John producing very satisfactory returns. Small quantities shipped to Canada outside this period sold for low prices. The average net return for the year, to growers, for lemons sent to St John was 9/3 per crate. Thirty-two crates of lemons shipped to Bermuda produced an average net return to growers of 10/10 per crate.

Tangerines and other small Citrus Fruits.—The Depot made small shipments of Mandarin and Portugal oranges and tangerines to Bermuda and St. John, but apart from the market in Bermuda which called for highly coloured tangerines of the choicest quality, there was little demand for these fruits and, with the exception mentioned, prices were so poor that it seemed hardly worth while to ship them. These fruits have usually been packed in tomato lugs, and a trial shipment of Portugal oranges packed in citrus crates was made to St. John this year in an attempt to increase the net return to growers by reducing packing costs, but the pack was not favourably received by the trade.

Net returns to growers were from 3d. to 7d. per tomato lug for these types of citrus fruits shipped by the Depot to St. John, and from 1/- to 2/1 for tangerines shipped to Bermuda. Small quantities were also packed for private shippers.

Avocado Pears.—The total quantities of Avocado Pears packed by the Depot during the year under review was slightly more than in any one of the previous six years. All the Avocado Pears packed by the Depot in 1937 went to Bermuda, and quantities marketed by the Depot and those marketed by private shippers both show increases over last year's figures. Avocado pears brought to the Depot for shipment varied in size even more than usual, and from 10 to 30 fruits were required to fill a tomato lug. Fortnightly shipments were made by the Depot to its agent in Bermuda from the end of May to the close of the year. Net returns paid by the Depot to growers per tomato lug were around 5/6 at the beginning of the season, declining steadily to 1/10 in October when Avocado pears were plentiful, and rising again to about 2/6 in December.

Mangoes.—The crop of mangoes was light. The quantity of ordinary mangoes packed was less than in 1936 and of grafted kinds about the same. Average net returns to growers in respect of ordinary mangoes marketed by the Depot's agent in Bermuda this year were 1/4½ per citrus crate higher than last season, and in respect of grafted varieties 7½d. per tomato lug higher than last season.

Pumpkins.—Efforts were continued during the year to build up a trade in the export of pumpkins to Bermuda. There was a fair demand in that island for these vegetables throughout the year excepting during the months of August, November and December when Bermuda grown pumpkins were available. The quantity of pumpkins shipped to the Depot's agent would have been greater had not supplies been curtailed on account of the exceptionally long dry season experienced in Dominica in 1937. Returns paid by the Depot to its suppliers averaged 0.9 pence per lb. Although barrels had to be purchased from these returns, prices were sufficient to induce peasants to bring pumpkins to the Depot. During the latter months of the year a private shipper also sent pumpkins to Bermuda.

Finance.—The payments in advance for local expenses on fruit marketed by the Depot and the purchase of packing materials are financed by an Advance Account.

The General Expenditure and Revenue of the Government Fruit Packing and Marketing Depot and Cold Storage for the year are given in the statement following this report, which shows that the revenue was £228. 18. 11½ more than the expenditure. This statement does not include the cost of electric current supplied to the Depot for lighting and power and for which no charge is made, or depreciation on buildings and plant.

General.—All green limes for shipment to the United States of America, packed at six licensed packing houses, were inspected by the Officer-in-Charge or the Foreman.

The Foreman was the officer appointed to witness sales of vanilla in Roseau and recorded 1,182 sales during the season. The Officer-in-Charge was Vanilla Examiner and inspected all vanilla exported.

The Officer-in-Charge was Secretary of the Fruit Trade Committee and of the Statutory Committee for Export Values.

During the year 317 letters and 92 cablegrams were despatched from the Depot. Four hundred and eighty-one account sales were sent to growers in respect of produce shipped by the Depot on their behalf. Account sales were usually submitted to growers and returns paid within a week of receipt of account sales from the Depot's overseas agents. Weekly reports of values of produce as computed by the Statutory Committee for Export Values, together with local values of produce, were compiled and sent to the Customs Department and the local press.

Repairs, etc. Much work was done on the improvement and re-conditioning of plant and the interior of the Depot building during the less busy periods of the year, most of the skilled work being carried out by the two foremen. Work done included whitewashing and painting the principal packing room and the engine room, painting the refrigerating plant and the brine pipes and woodwork in the pre-cooling chambers and painting, re wiring and thoroughly overhauling the citrus washing and sizing machinery.

Acknowledgments. The writer again gratefully acknowledges the assistance and co-operation of the Depot staff. He also thanks growers of produce for their co-operation, and the Engineer of the Imperial College of Tropical Agriculture and the officers of the Public Works Department for technical advice.

W. E. BASSETT.
Assistant Agricultural Officer,
Officer-in-Charge,
Government Marketing Depot.

APPENDIX.

GOVERNMENT FRUIT PACKING AND MARKETING DEPOT AND COLD STORAGE.
STATEMENT OF GENERAL EXPENDITURE AND REVENUE
FOR THE YEAR ENDED 31ST DECEMBER, 1937.

EXPENDITURE.				REVENUE.			
Head XV (1).				Head V (4).			
Personal Emoluments ..	£387.	15.	7	Sale of Ice	£259.	0.	9
Running & Maintenance.	141.	10.	3	Cold Storage Rents ..	100.	1.	11½
Wages of Staff	94.	11.	6	Fees for Charging Batteries	2.	5.	0
Contingencies	5	9.	4	Profits on Materials, & Marketing Commission	309.	13.	8
Printing and Stationery..	12.	18.	11	Inspection, Packing House and Overtime Fees	367.	10.	4
	642.	5.	7				
Head VII (2).							
Half of Manager's Salary & House Allowance ..	167.	7.	2				
	809.	12.	9				
Excess of Revenue over Expenditure	228.	18.	11½				
	£1,038.	11.	8½		£1,038.	11.	8½

R. L. BLANCHARD,
Clerk,
Government Marketing Depot.

W. E. BASSETT,
Officer-in-Charge,
Government Marketing Depot.

APPENDIX IV.

REPORT BY THE IMPERIAL INSTITUTE ON VETIVER ROOTS FROM DOMINICA.

IMPERIAL INSTITUTE,
16TH DECEMBER, 1937.

WITH reference to your letter No. 210/37 of the 14th August last and previous correspondence regarding the Vetiver Roots shipped per S. S. *Ingoma* on behalf of Mr. A. C. Shillingford, I am desired by the Director to inform you that, as indicated in the last paragraph of Imperial Institute letter of the 21st July, we have now examined the small sample of the roots which we retained here. The results may be summarised as follows.

On steam distillation the ground roots furnished 1.9 per cent of a dark reddish-brown, very viscous oil. The oil had the following constants, which are shown in comparison with those obtained for Messrs. A. H. Green's sample which was the subject of Imperial Institute report of the 30th June, 1936, and with the corresponding figures recorded for Vetiver oil distilled in Europe from imported roots and for that distilled commercially in Reunion :—

	A. C. Shillingford's Sample.	A. H. Green's Sample.	European-distilled oil.	Reunion distilled oil.
Specific Gravity at 15.5/15.5°C	1.0416	1.0325	1.013 to 1.040	0.990 to 1.020
Optical Rotation aD (Oils too dark to obtain reading)			+25° to + 41°	+14° to + 37°
Refractive Index nD20°C	1.5255	1.5265	1.522 to 1.528	1.515 to 1.529
Acid Value	78.9	47.8	27 to 75	4.5 to 17
Ester Value	17.2	21.2	8.4 to 23	5 to 20
Ester Value after acetylation	114.0	130.0	120 to 173	119 to 145
Solubility in 80 per cent alcohol at 15.5°C	Soluble in 1 vol. becoming slightly opalescent with 10 or more vols.	Soluble in 1 vol. becoming turbid with 5 or more vols.	Soluble in 1 to 2 vols. With more sometimes opalescent to turbid.	

The yield of 1.9 per cent of oil obtained at the Imperial Institute from the present sample is considerably lower than the 3.7 per cent of oil obtained from the earlier sample of Dominica vetiver roots (A. H. Green's material.) The yield is however rather higher than those (1.19 to 1.29 per cent) obtained respectively by Messrs. Stafford Allen & Sons Ltd. and Messrs. A. Boake, Roberts & Co. from the same roots (see Imperial Institute letter of 21st July last).

Although both Dominica samples were distilled under the same conditions at the Imperial Institute, it will be observed that the constants of the oils obtained from the present and previous samples differed a good deal. The present oil possessed an abnormally high acid value, and its specific gravity was also higher than the recorded figures for vetiver oils distilled in Europe from imported roots. The odour of the oil was moreover harsher and altogether less pleasant than that of the oil from the previous sample of roots, which was generally well reported on by the trade.

It would seem probable that the present roots supplied by Mr. A. C. Shillingford were grown on poorer, sandy soil, and collected under less favourable conditions, than the previous sample submitted by Messrs. A.H. Green. It will remain to be seen what results are obtained from the recent 2-ton consignment of roots supplied by Messrs. Green.

The subject of the commercial utilisation of vetiver roots was brought to the notice of the Imperial Institute Essential Oils Committee at a meeting recently held, and I now transmit to you the following observations of the members.

It was agreed that very little vetiver root is distilled in the United Kingdom where the market for the oil is very small. Reference was made to the fact that the price of the Bourbon oil was subject to wide fluctuations and was at the date of the meeting quoted at about 22*s*. per lb. compared with about 30*s*. per lb. at the beginning of the year. One year, it was remarked, the price fell to as low as 9*s*. per lb. It was decided therefore that under present conditions, as far as the United Kingdom market was concerned, the extended production of vetiver roots in any part of the Empire could not be recommended It was however suggested that consideration might be given to the economic possibilities of exporting these roots to France or to the United States as available statistics show that both these countries import appreciable quantities from Java.

APPENDIX V.

REPORT BY THE IMPERIAL INSTITUTE ON DERRIS AND OTHER ROOTS FROM DOMINICA.

IMPERIAL INSTITUTE,
22ND DECEMBER, 1937.

THE six samples which are the subject of this report were forwarded to the Imperial Institute by the Acting Agricultural Superintendent, Dominica, and are referred to in his letters No. 188/37 of the 5th August and No. 300/37 of the 28th October, 1937.

The Samples had been prepared by a planter in Dominica and it was desired to ascertain their quality and value as sources of insecticides.

Description.

"*Derris elliptica.*" Weight 3¼ lb.

Pieces of fine and coarse roots, up to ½ in. in diameter and of dark reddish-brown colour.

"*Derris malaccensis* (*erect*)." Weight 3 lb.

Pieces of fine and coarse roots, up to ½ in. in diameter and of dark reddish-brown colour.

"*Derris malaccensis* (*climbing.*)" Weight 2½ lb.

This sample consisted of complete roots, with a maximum diameter of ⅜ in. and of dark-brown colour.

*"*Lonchocarpus guianensis*" Weight 3¼ lb.

Pieces of fine and coarse roots up to ½ in. in diameter and of dark brown colour. The sample was damp and somewhat mouldy.

†"*Lonchocarpus dominguensis.*" Weight 4½ lbs.

* The sample was thus labelled but has since been identified at Kew as a species of *Phyllanthus*.
† Since identified at Kew as *Moringa oleifera* Lam.

Pieces of root up to 2¾ inches in diameter and of dark brown colour. The sample was very damp, badly decomposed and infested with maggots.

"*Clibadium Vargesii.*" Weight 3 lb.

Pieces of fine and coarse roots, up to ¾ inch in diameter and of dark brown colour. The sample was rather damp and somewhat mouldy.

Results of Examination.

The three samples of derris root were examined with the following results :—

	Derris elliptica	*Derris Malaccensis*	
		Erect.	*Climbing.*
	per cent	per cent	per cent
Moisture	8.3	6.4	6.0
Ether Extract	3.8	11.4	13.3
Rotenone :—			
Calculated from carbon tetrachloride complex	0.8	2.8	4.6
Recrystallised from alcohol	0.6	2.0	3.6

The three other samples were submitted to Durham's qualitative colour test for rotenone, with a negative result in each case.

Remarks.

Consignments of derris root are sold in the United Kingdom on a basis of 17 per cent ether extract, whilst in the United States a basis of 5 per cent of rotenone is adopted, but there is a tendency to recognise both these criteria of toxic value in the two markets. In the United Kingdom the importance of the rotenone content is fully recognised and at least one leading firm of buyers purchase their supplies of derris root on the basis of rotenone *plus* ether extract, whilst in the United States attention is now being paid to ether extract content as well as to the percentage of rotenone.

The results of the examination show that none of the three present samples of derris roots is up to the standard which forms the basis for the sale of derris. The sample of *D. elliptica* roots is very low in ether extract and rotenone, and would be of no commercial interest. The two samples of *D. malaccensis* roots yielded a much smaller percentage of ether extract than the normal figure for roots of this species (viz. 25–30 per cent), whilst as regards the rotenone content, which in this species is commonly at best only as high as 3 per cent, the "erect" sample gave a normal figure and the "climbing" sample a much higher one. It is however very doubtful whether material similar to either of these two samples, and particularly the "erect" variety, would be saleable in the present state of the market, as it is understood that there are fair stocks on hand unsold.

The current price of derris root in London is 6d. per lb. c.i.f., based on an ether extract content of 17 to 18 per cent.

If the growers in Dominica intend to cultivate derris roots on a commercial scale it would be advisable to consider the introduction of a better strain. Information on this point is given in the Bulletin of the Imperial Institute, Vol. XXXIV (1936), p. 469.

The three other samples, viz. Phyllanthus, Moringa and Clibadium, were shown by Durham's colour test to contain no rotenone, and if, therefore, any rotenone was originally present in these roots it is probable that it has been destroyed by the decomposition of the materials which have taken place owing to the wet condition in which they were packed. Alternatively, rotenone may never have been present. Further samples should therefore be submitted to the Imperial Institute for examination to determine this point and care taken to ensure that they are well air-dried before being packed.

APPENDIX VI.

CITRUS PESTS INVESTIGATIONS.

REPORT OF THE ENTOMOLOGIST ON TWO VISITS TO DOMINICA IN 1937, BY R. G. FENNAH.

The Entomologist of the Citrus Pests Investigation stayed in Dominica between September 19th and October 3rd, and from December 11th to the end of the year. In the time available attention was principally given to Citrus Weevils, while other problems were examined as opportunity permitted. The following summary gives in outline the points of chief importance.

Citrus Weevils. (*Diaprepes abbreviatus* L. and *D. famelicus esuriens* Gyll.)

In the earlier visit a survey was made of Weevil incidence in the Roseau Valley. The degree of infestation was found to be low, and beetles, though present everywhere, were not abundant. Statistical information derived from independent sources reveals that adult weevils are present in the citrus fields at all times of the year, and that their numbers are highest between May and September. On both visits egg-masses were found, though they were more uncommon in December. The degree of egg-parasitism in September was high, being 73.8% in a sample of five hundred eggs; the percentage of weevil eggs which failed to hatch was 10.1, and of these rather more than half contained a dead parasite. The second visit at the end of the year revealed that parasitism varied from 20% to 80% between samples taken in different spots in the Roseau Valley. The presence of egg-masses on the trees at all months of the year, though not yet definitely proved, is considered most probable in view of the constant presence of weevils, and while such a supply of egg-masses is available there is reason to expect that the present satisfactory rate of parasitism will be maintained.

In one or two spots damage to roots by weevil larvae was found to be sufficiently severe to warrant the use of protective measures. It was suggested that such damaged trees should be treated in the following manner: the soil should be removed from below the crown to a depth of about nine inches (or less if the tree is very small) and the lateral roots bared to eighteen inches to two feet from the trunk. The result will be that a "basin" is formed beneath the tree, in which all the crown roots are exposed. This basin may be drained by means of a narrow channel cut from its lowest point towards a field drain, and the channel filled with stones to prevent the collapse of its sides. Such exposure of the crown will prevent any further weevil damage being done to this part, which is usually that most severely mutilated.

On the second visit certain experiments which had been started in Trinidad were continued, and the results indicated that the use of the cover crop *Tephrosia candida* may be a factor of some importance in weevil control. It was found that, like others of its genus, the plant contains a toxic principle which is present in greatest amount in the seeds, and, in decreasing quantities, in the stem—and root-cortex, and in the leaves. The plant is definitely unattractive to adult weevils, and, when eaten by them, proves poisonous. Further work is being carried out but even at this stage it is clear that in islands where weevils occur *Tephrosia* is preferable to most cover crops in present use, which are either host plants of the insect or of a less satisfactory growth habit.

Damage to Oranges by "Sucriers."—It is commonly reported that oranges are damaged late in the season by being punctured by "Sucriers," and that losses from this source are considerable. Experiments with poisoned baits have given very satisfactory results, and offer a cheap means of reducing local populations of these birds. The bait is prepared as follows: a few sweet oranges are cut in half and squeezed lightly. Into each half, as uniformly as possible, 1 or 1½ cc. of a 5% solution of strychnine is injected by repeated stabs with a pipette. The halves are then lodged in the main forks of the trees requiring protection, one or two halves being used according to the size of tree. Birds are killed on the spot within a few moments of feeding, and must be collected. Daily records of collections should be kept.

Damage by Moths.—Damage to orange and grapefruit by moths has been noted. This appears to be mainly seasonal, and is serious only at certain times. The chief damage is caused by common mould fungi which obtain entry into the fruit through the insect puncture, and cause rotting. Further data on this problem are being sought. In the meantime baits made of sodium arsenite (2 gm.) brown sugar (150 gm.) and water (1,200 cc.) hung in shallow tins in the main branches may be used to secure samples of the lepidopterous fauna of the affected groves. The value of such baits for purposes of control is doubtful.

Damage to the Collar.—It was noted in a number of instances that trees, apparently otherwise healthy, were suffering from damage to bark around the collar, and that this damage was accompanied by the presence of the bark-boring beetle *Leptostylus praemorsus*. This beetle was rarely found even touching the edges of the living wood, and it is undoubtedly of secondary importance. In orange fields, or on low-budded trees, the primary cause is often gummosis, though implemental damage is also common.

APPENDIX VII.

CERCOSPORA LEAF SPOT DISEASE OF BANANAS.

Leaf spot disease of bananas, variously known as Sigatoka disease and Cercospora leaf spot, is one of the most destructive diseases of bananas known and as an outbreak has been identified in February 1938 in one cultivation in Dominica, the following notes are published for the information of growers.

Description of the Disease.

The symptoms of the disease are clearly-defined, elliptical black spots which, although commencing on the uppermost, succulent leaves, are most noticeable on the older and lower leaves, where the spots develop white or greyish centres surrounded by a thin black margin. They are generally about half an inch in length in the same direction as the veins, and one-tenth of an inch or rather more in breadth, but sometimes become larger. The usual shape of the leaf spots is thus that of a human eye, although sometimes a number of spots may be oval or several may touch and produce irregular blotches.

The white centres contain a large number of spores or "seeds" of the Cercospora fungus, which are easily blown long distances in the air and on settling on a young banana leaf produce more black spots in about six weeks. These in turn become white in the centre, producing more spores. It is these white centres, still noticeable after the leaf has turned to trash, which distinguish this disease from other forms of leaf spotting.

Nature of the Damage and How Spread.

Round each spot the leaf soon turns yellow and then dies and becomes a patch of trash and the portion between the spots and the margin of the leaf may also die, so that affected leaves often have a broad irregular band of trash along both edges. In severe cases whole leaves may stand out dry and trashy and if there are many of these, the fruit, if formed, ripens abnormally and is unfit for consumption and for export. The final stage is a drying up of the whole plant, when it somewhat resembles a plant attacked by Panama Disease.

Unlike that disease, Cercospora is capable of attacking most kinds of banana and plantain, but it is the Gros Michel banana which is liable to suffer the greatest damage. In Trinidad one large cultivation can no longer produce a single bunch of saleable fruit, although about two years ago it was in full production; and under certain circumstances the disease can spread with great rapidity. On the other hand, there are districts in that island and in Jamaica where the disease has been present for some time, but is doing little or no damage. In the latter island it was stated that the disease does not necessarily "limit production where conditions are generally favourable for the cultivation of bananas" —(Journal of the Jamaica Agricultural Society. December 1937. p. 603) and it is the opinion of the Director of Agriculture that many districts will be able to continue profitable production in spite of the disease.

Nevertheless, where bananas are grown under unsuitable conditions growers are faced with heavy or even total loss of crop and some authorities consider that as the disease is rapidly dispersed by wind it is only a matter of time for it to become widely established in all these islands.

Conditions which are most likely to favour extensive damage are of two kinds: first, those where heavy rainfall and little or no dry season cause very soft growth of the plants and damp conditions make for the rapid multiplication of the spots; and secondly, those leading to the poor growth of plants, which in consequence are weak in constitution and easily fall a prey to disease It may perhaps be mentioned in this connection that Panama Disease has already done considerable damage to some cultivations in Dominica and in such cultivations Cercospora disease may be expected to complete the ravages commenced by Panama Disease.

Cercospora spores are dispersed in large numbers from the white-centred black spots at any time there is any movement of air and the leaf surface is dry. They are known to travel long distances through the air and when they settle on the three youngest leaves at the top of a susceptible banana or allied plant, infection is set up. In about six weeks, new spots are again giving off spores, so that at least eight generations can be produced in a year. If we assume that a spot gives rise to only ten spores, one spot may multiply to 100 million spots in a year. Actually a spot gives rise to many more spores than ten, though not all of them will reach a young banana leaf and the situation of many plots in Dominica in sheltered ravines and pockets may be a natural means of delaying the spread of the fungus from one locality to another, though this cannot be counted on.

It should be remembered that the spots are very small in relation to the size of a banana leaf and by a process of simple multiplication, a mild infection of a few dozen spots per leaf on only a few plants may in a short time become a heavy infection of countless millions of spores, readily blown from one side to the other and from north to south in a comparatively small island like Dominica and this is exactly what has happened in Jamaica and other producing countries.

Remedial Measures. (a) **Destruction of Diseased Material.**

There is no known cure for the disease and the best that can be done is to reduce its intensity and to attempt to delay the spread of the fungus. Only clean, uninfected trash should be utilised as wrapping material and as matting in lorries and lighters, and the loose trash at buying stations should be systematically burnt after each shipment Spotted leaves of the growing plants should in the early stages be pruned off and covered with soil, thereby preventing the spread of spores. This method is usually less expensive than burning and is said to be quite as effective. A routine pruning at intervals of not less than three weeks is recommended when an outbreak is first noticed, but once a cultivation becomes thoroughly infected, this treatment would be of little or no avail. The burning of trash would also be of doubtful value if the disease were already widespread in cultivations but until that happens, it would reduce the number of spores capable of spreading the disease.

(b) **The Use of Chemicals.**

In cultivations where infection is established and causing losses to the grower, the Jamaica experience favours spraying with Bordeaux mixture (Copper sulphate and lime, 5 lbs. each, Water 50 gallons) or dusting with a mixture of equal parts of copper sulphate and lime, in both cases the object being to prevent or at least reduce spore formation on older leaves, (since a low degree of spotting enables bunch formation to proceed normally,) and to coat young leaves with a protective layer. The question of cost has to be considered, however. To obtain *full* control spraying would have to be done at intervals of about three weeks or oftener throughout the year, but in practice it has been found that the cost per acre per annum can be kept within reasonable bounds (about £3) by spraying five or six times a year during the dry periods occurring there in March and April, July and October and still minimise infection very considerably. The question as to whether a grower could afford to adopt such measures would have to be decided by the profit and loss account of each individual in relation to his costs of production and returns, but areas producing a high percentage of count bunches should pay for the protection afforded by spraying or dusting. The latter operation has to be carried out in still weather to ensure that the dust settles on the leaves and to avoid heavy wastage of the powder.

(c) **Cultivation.**

As already mentioned, Cercospora disease is most destructive under conditions which are not entirely favourable to banana growing, and under such circumstances pruning and spraying may only delay heavy losses and even total destruction of the crop for a limited time, however carefully carried out. Under Dominica conditions, it is therefore urgently recommended that growers pay very thorough attention to the selection of only the best areas for planting, use good vigorous planting material and in general maintain a high standard of cultivation to ensure strong, stocky plants capable of offering a high degree of resistance to the disease. Areas liable to extremes of very wet or very dry conditions should in any case be avoided. Excessive dampness, however, can to some extent be minimised by wide spacing and periodical pruning (desuckering) of unnecessary stems. Apart from Cercospora, the latter practice is desirable to prolong the productivity of banana cultivations and increase the count percentage, but is only too often neglected in Dominica.

(d) **Co-operation of Growers.**

It cannot be over-emphasized, however, that Cercospora spores are blown long distances through the air and in Jamaica the disease has become widespread in less than two years. In spite of that, however, 1937 coincided with a larger output of bunches in that island than for a number of years and if cultivators will co-operate with the Agricultural Department and the Banana Association in trying to check the spread of the disease, the banana industry may be capable of continuing to afford a very valuable source of revenue for a number of years. Growers should therefore notify the department or the district banana inspector immediately they discover the disease and are requested to give inspectors every possible assistance with control measures intended for their own protection and that of other cultivators who might suffer by their neglect.

RAINFALL RETURNS, DOMINICA, 1937.

Stations.		Jan	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Totals.
1. Batalie	L ...	7.75	2.60	.15	1.88	.74	3.83	2.56	5.12	5.60	3.98	14.60	1.96	50.77
2. Botanic Gardens	L ...	13.24	3.40	1.34	2.61	1.48	6.57	5.60	6.20	4.40	3.74	20.85	5.43	74.86
3. Bath	L ...	19.61	3.16	1.55	2.77	1.43	6.64	6.07	5.57	4.29	3.63	14.17	14.80	83.69
4. Blenheim	LAS.	9.74	7.32	3.57	7.70	4.50	7.46	4.31	9.53	5.61	20.93	9.22	17.38	107.27
5. Canefield	L ...	12.90	3.43	.98	3.56	1.70	9.52	5.98	7.47	4.38	3 20	20.67	4.32	78.11
6. Clark Hall	L ...	17.83	1.97	3.82	4.58	2.33	10.86	6.05	10.08	8.48	8.60	22.63	3.50	100.73
7. Copt Hall	L ...	19.03	7.86	3.19	7.37	4.31	12.51	12.39	12.20	9.09	7.05	24.44	11.24	130.68
8. Fond Hunt	I ...	23.51	9.99	3.25	10.34	2.69	16.15	12.67	14.33	13.67	16.39	10.45	19.45	152.89
9. Governor	W ...	15.24	6.05	4.28	7.31	7.93	6.84	5.60	10.51	18.54	28.30	23.50	13.74	147.84
10. Hampstead	LAS.	6.15	3.60	.60	5.15	5.55	5.05	4.00	7.34	9.59	19.91	16.93	9.23	93.10
11. Morne Bruce	L ...	15.15	3.85	1.62	2.96	2.40	7.20	6.03	7.08	4.57	4.22	21.73	6.05	82.76
12. Moore Park	I. ...	14.95	3.51	3.39	7.43	4.60	5.95	4.80	9.26	6.84	18.81	18.90	9.42	107.86
13. Picard	L ...	14.65	3.33	1.94	3.11	2.43	7.35	6.69	8.75	5.95	7.52	18.40	6.08	86.20
14. Pte. Mulâtre	W ...	13.78	6.28	2.74	4.62	3.97	5.47	5.65	9.77	10.70	9.41	23.33	2.37	98.09
15. Rosalie	W ...	15.80	5.46	2.12	4.65	4.94	7.42	5.96	12.32	14.23	12.67	28.78	6.49	120.84
16. Ridgefield	L ...	19.78	7.17	3.02	7.34	5.02	10.50	8.59	12.11	5.88	8.28	22.83	8.18	118.70
17. Shawford	I ...	67.90	16.75	13.26	12.58	10.36	26.79	15.66	24.51	23.18	14.30	26.02	20.65	271.96
18. Sherwood	I ...	32.75	8.70	6.00	10.50	10.30	17.75	14.40	18.90	9.40	17.10	28.20	13.10	187.10
19. Stowe	W ...	13.73	6.02	2.25	5.93	4.05	5.97	7.10	9.97	9.79	10.16	28.87	6.15	109.99

Mean Rainfall 19 Stations ... ... 115.97 inches.
,, ,, 9 Leeward Stations... ... 89.61 ,,
,, ,, 4 Windward ,, ... 119.19 ,,
,, ,, 4 Inland ,, ... 179.95 ,,
,, ,, 2 Lasoye ,, ... 100.18 ,,

METEOROLOGICAL SUMMARY, BOTANIC GARDENS, DOMINICA, 1937.

Year. 1937.	PRESSURE. *Corrected & reduced to 32° F., M S.L.*				TEMPERATURE.								RELATIVE HUMIDITY.		RAIN-FALL
	Highest.	Lowest	Means.		Absolute.		Mean Values.						Means.		Amount.
					Max.	Min.	Max.	Min.	Dry Bulb.		Wet Bulb.				
			9 a.m.	3 p.m.					9 a.m.	3 p.m.	9 a.m	3 p.m.	9 a.m.	3 p.m.	
	IN.	IN.	IN.	IN.	°F	°F	°F	°F	°F	°F	°F	°F	%	%	IN
January ...	30.08	29.84	30.00	29.92	84	64	82	66	75	80	71	73	81	69	13.24
February ...	30.06	29.89	30.01	29.93	86	62	83	65	76	82	72	74	79	64	3.40
March ...	30.05	29.86	29 99	29.97	89	63	86	67	79	80	72	74	67	59	1.34
April ...	30.09	29.87	29.99	29.93	89	65	86	68	81	83	74	76	74	67	2.61
May ...	30.01	29.86	29.97	29.91	92	67	89	71	83	87	75	77	67	58	1.48
June ...	30.04	29.91	30.00	29.95	91	69	89	73	83	87	77	79	73	68	6.57
July ...	30.05	29.88	29.98	29.95	91	69	89	72	83	87	77	80	72	69	5.60
August ...	30.02	29.84	29.96	29.91	91	70	89	73	83	88	78	80	76	66	6.20
September ...	29.96	29.81	29.91	29.85	93	72	90	75	84	88	79	80	78	69	4.40
October ...	29.95	29.79	29.91	29.84	91	72	89	74	84	88	78	79	72	65	3.74
November ...	29.96	29.71	29.89	29.82	91	70	88	73	83	85	77	78	76	68	20.85
December ...	30.00	29.77	29.92	29.87	90	67	86	70	79	84	74	76	77	63	5.43
Year ...	30.02	29 84	29.96	29.90	90	68	87	71	81	85	75	77	74	65	74.86

Highest Barometer Reading (corrected):	30.09 in.	on 9th April.
Lowest ,, ,, ,,	29.71 ,,	,, 10th November.
Highest maximum temperature:	93°F	,, 20th September.
Lowest minimum ,,	62°F	,, 12th February.
Greatest rainfall in 24 hours:	6.27 in.	,, 28th November.

RAINFALL AT THE BOTANIC GARDENS, DOMINICA, 1918–1937.

	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	Monthly Mean Rainfall.
January ...	6·02	2·42	7·54	6·82	6·50	3·82	6·25	7·88	3·68	5·50	6·60	5·18	10·65	1·47	5·47	7·30	4·81	2·37	3·46	13·24	5·85
February ..	8·73	1·52	4·76	1·02	4·30	2·30	1·90	1·95	2·46	4·50	4·25	3·13	2·07	1 05	1·57	2·13	1·70	1·59	2·50	3·40	2·84
March ...	3·32	·69	3·80	4·46	2·80	3·46	·66	3·50	·96	5·37	6·30	7·36	3·89	·59	1·56	2·37	3·36	6·90	.82	1·34	3·18
April ...	1·86	2·36	·22	3·06	2·26	3·77	1·46	·40	2·77	4·67	4·16	1·27	5·01	·51	2·33	2·03	2·91	1·45	3.04	2·61	2·41
May ...	5·90	4·60	2·38	1·54	2·64	·13	3·18	2·76	2·44	6·69	2·25	2·80	2·21	1·70	5·07	2·26	3·82	4·27	2·34	1·48	3·02
June ...	6·04	3·88	3·48	1·96	7·14	4·18	4·42	5·80	5·76	15·03	6·68	10·87	7·32	9·98	10·72	7·05	2·59	5·04	6·47	6·57	6·54
July ...	11·28	12·64	12·08	11·18	6·08	8·20	13·64	6·23	10·14	9·61	6·58	13·13	7·90	18·45	8·05	12·30	9·54	13·47	18·48	5·60	10·72
August ...	8·46	9·64	8·76	9·30	9·26	11·44	11·28	13·88	10·10	4·65	12·80	12·55	6·76	17·44	7·23	7·94	7·61	8·87	10·38	6·20	9·72
September.	4·14	7·06	8·60	6·28	10·68	4·28	4·88	9·12	4·12	6·20	8·10	5·63	14·66	13·51	6·13	11.51	4·08	12·93	11·14	4·40	7·87
October ...	6·67	7·50	12·60	9·41	2·68	9·84	10·98	12·55	5·86	8·84	4·35	12·19	3·15	9·71	6·72	9·26	3·89	5·43	7·65	3·74	7·65
November.	3·36	9·02	4·62	2·44	3·00	1·06	6·86	9·60	7·54	8·70	7·93	14·39	5·51	11·90	13·83	11.04	5·58	3·39	12·14	20·85	8·13
December .	5·86	6·70	5·62	4·22	6·90	1·92	13·65	2·02	3·75	1·37	5·38	8·48	3·66	7·56	5·21	7·03	9·46	6·24	10·84	5·43	6·06
Total ...	71·46	68·03	74·46	61·72	64·24	54·40	79·16	75·69	59·58	81·13	75·38	96·98	72·79	93·87	73·89	82·22	59·35	71·95	89·26	74·86	– –

Average year = 74·02 inches.